

**Fig. PA1: MAGNET-Automated Contracting System**

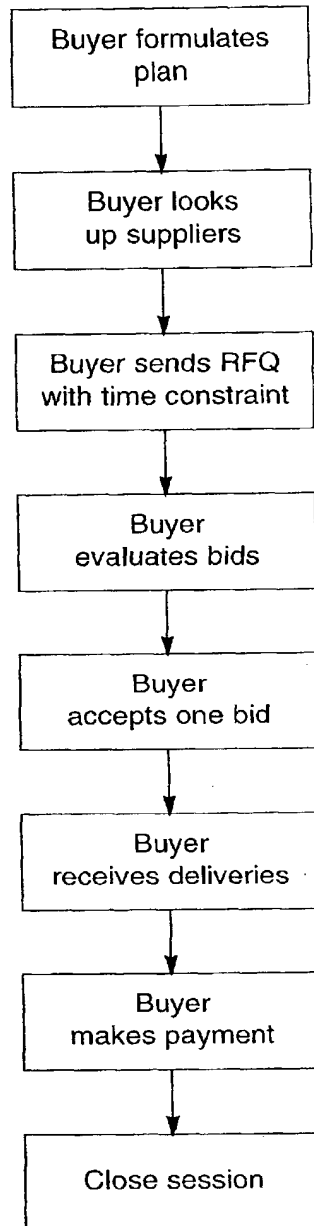
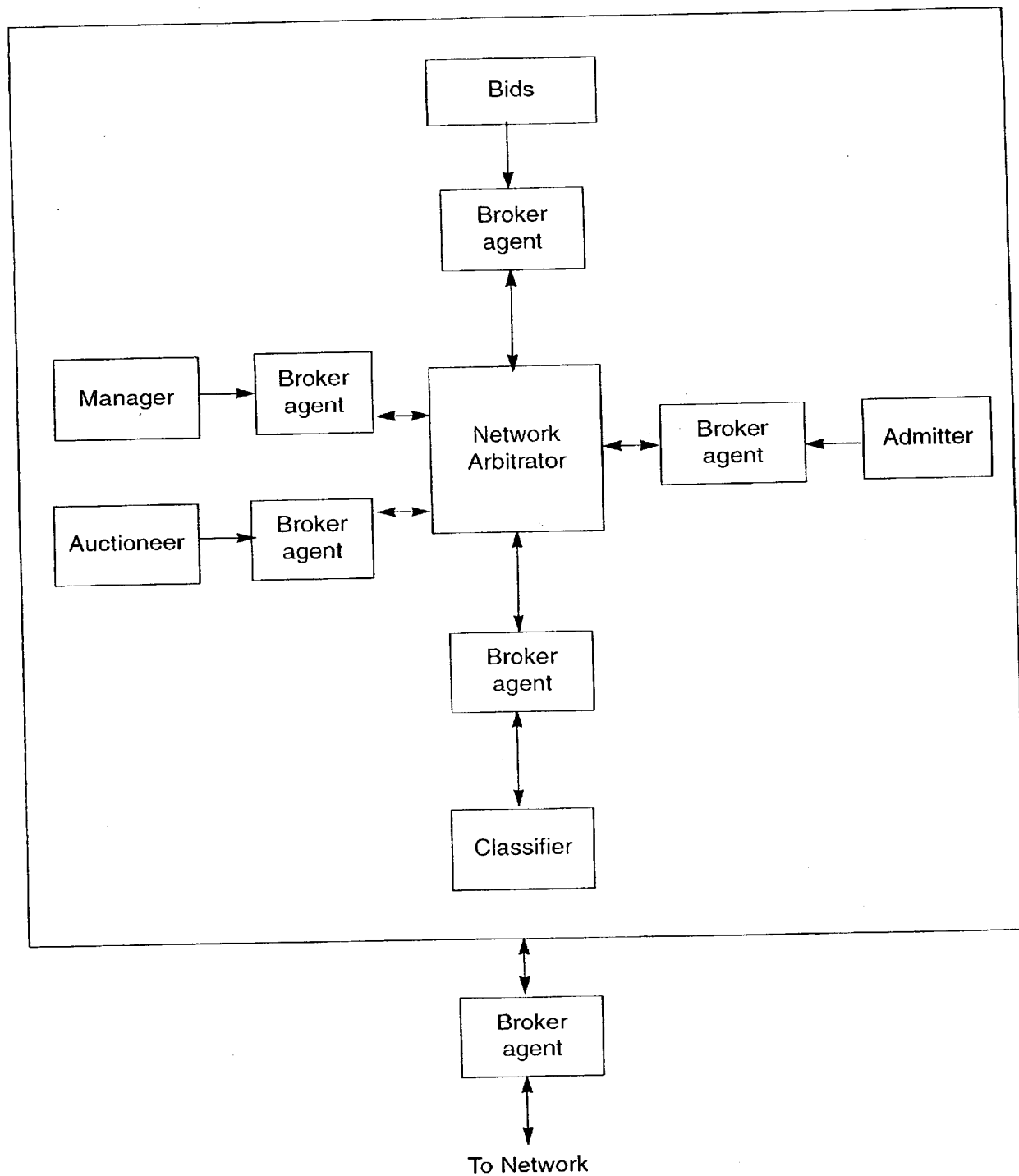
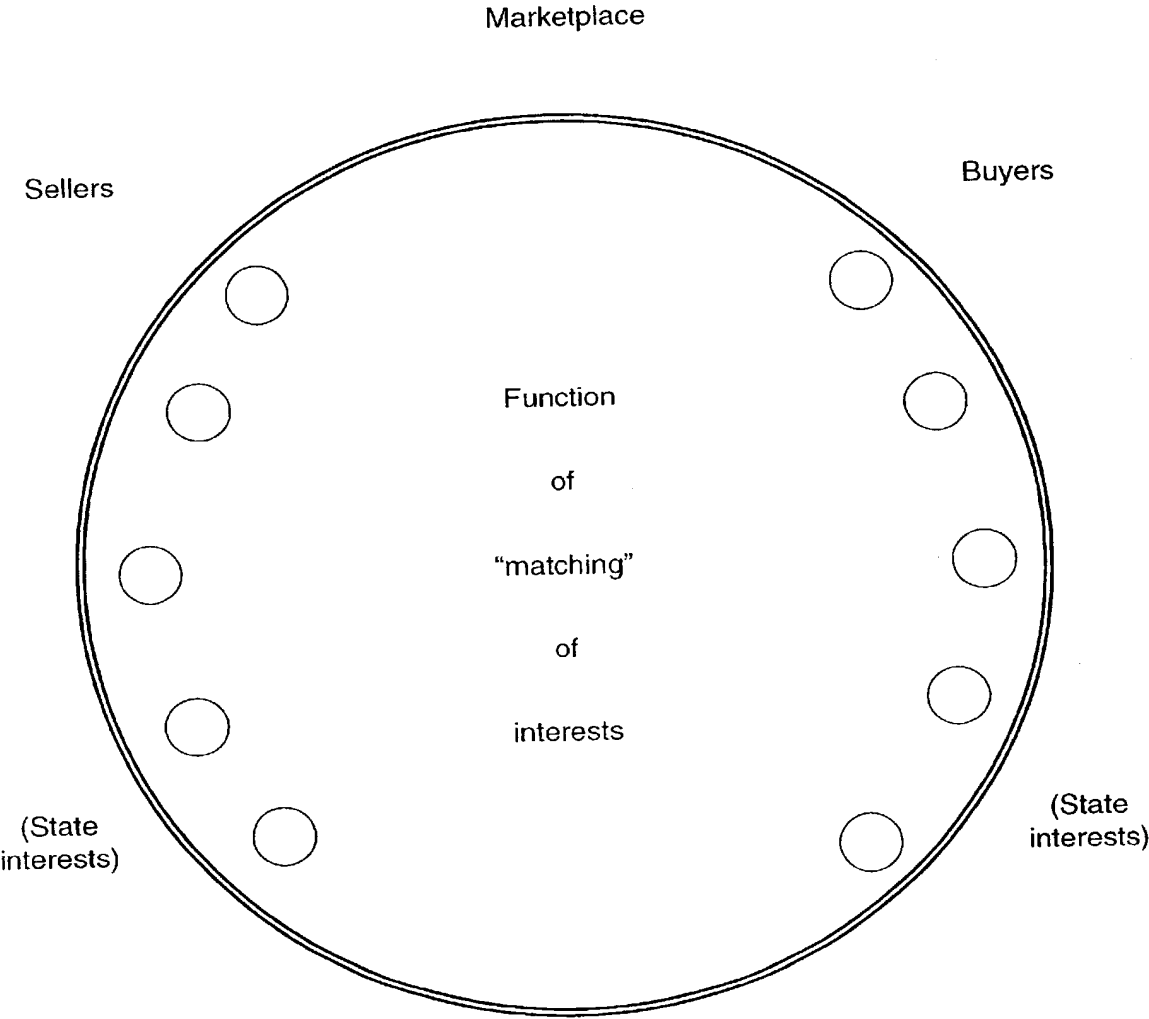


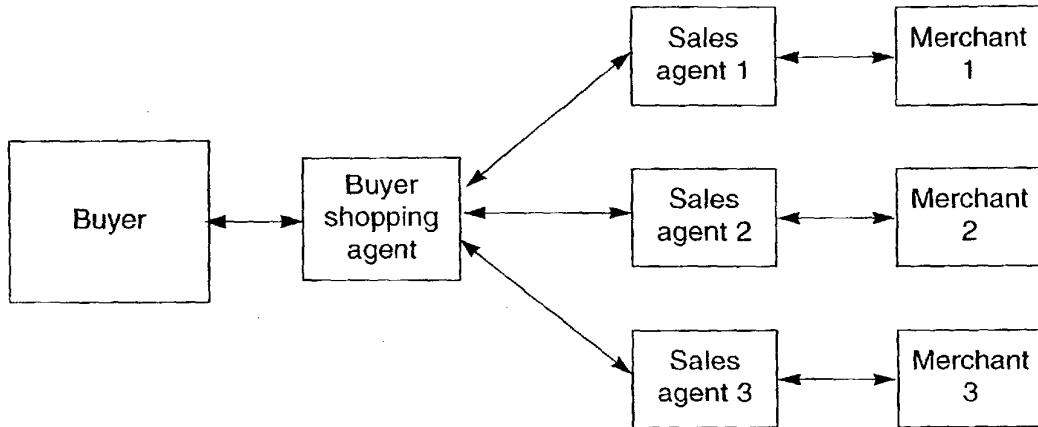
Fig. PA2: Fishmarket



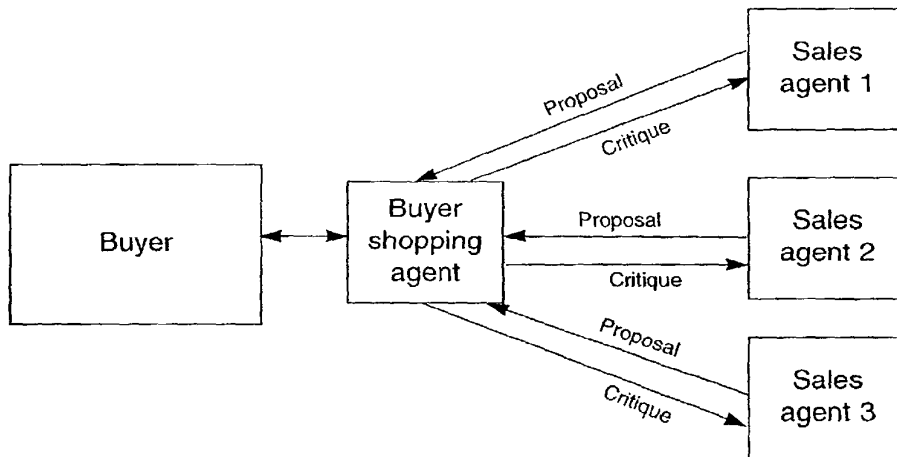
**Fig. PA3: Kasbah Marketplace**



**Fig. PA4A: Tete-a-tete (I): Integrative Negotiation**



**Fig. PA4B: Tete-a-tete (II): Bilateral Negotiation**



**Fig. PA5: Contract Net-4 Stages of the Contract Net**

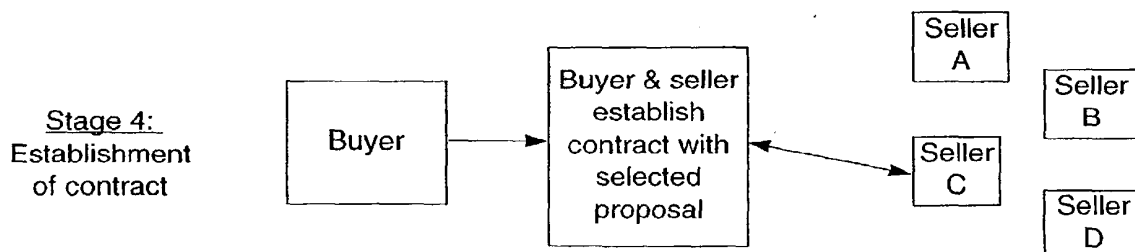
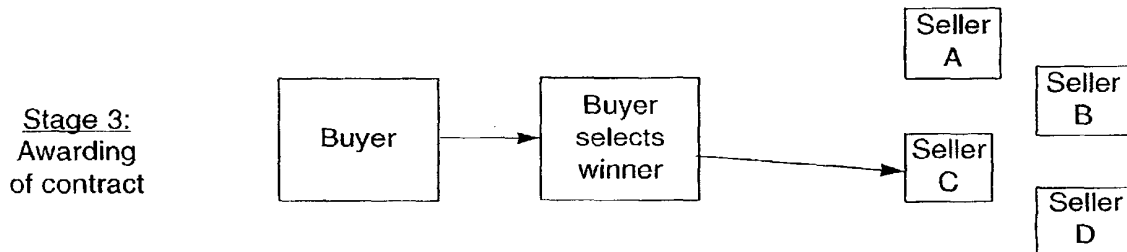
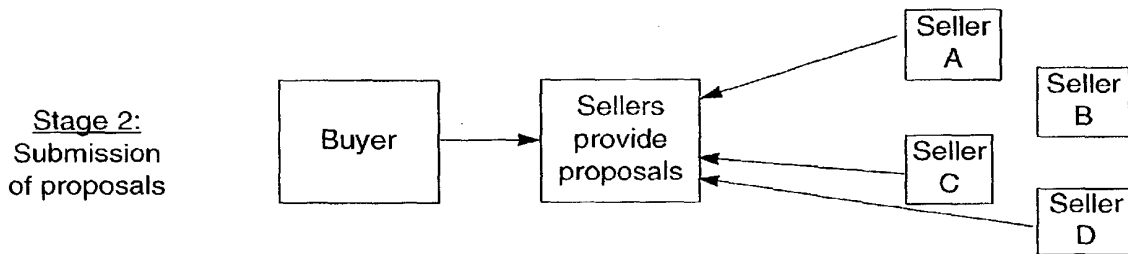
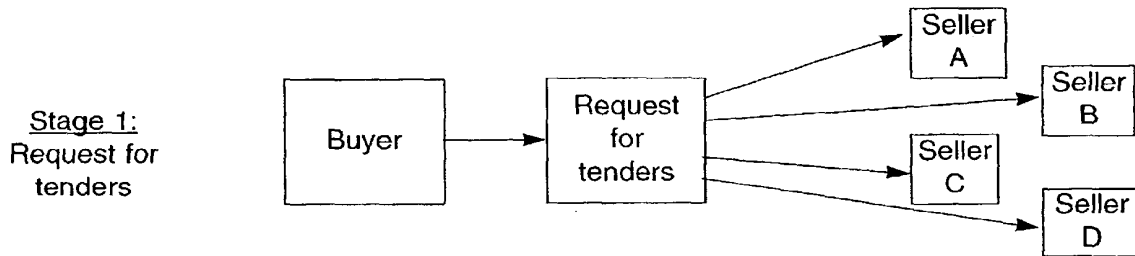
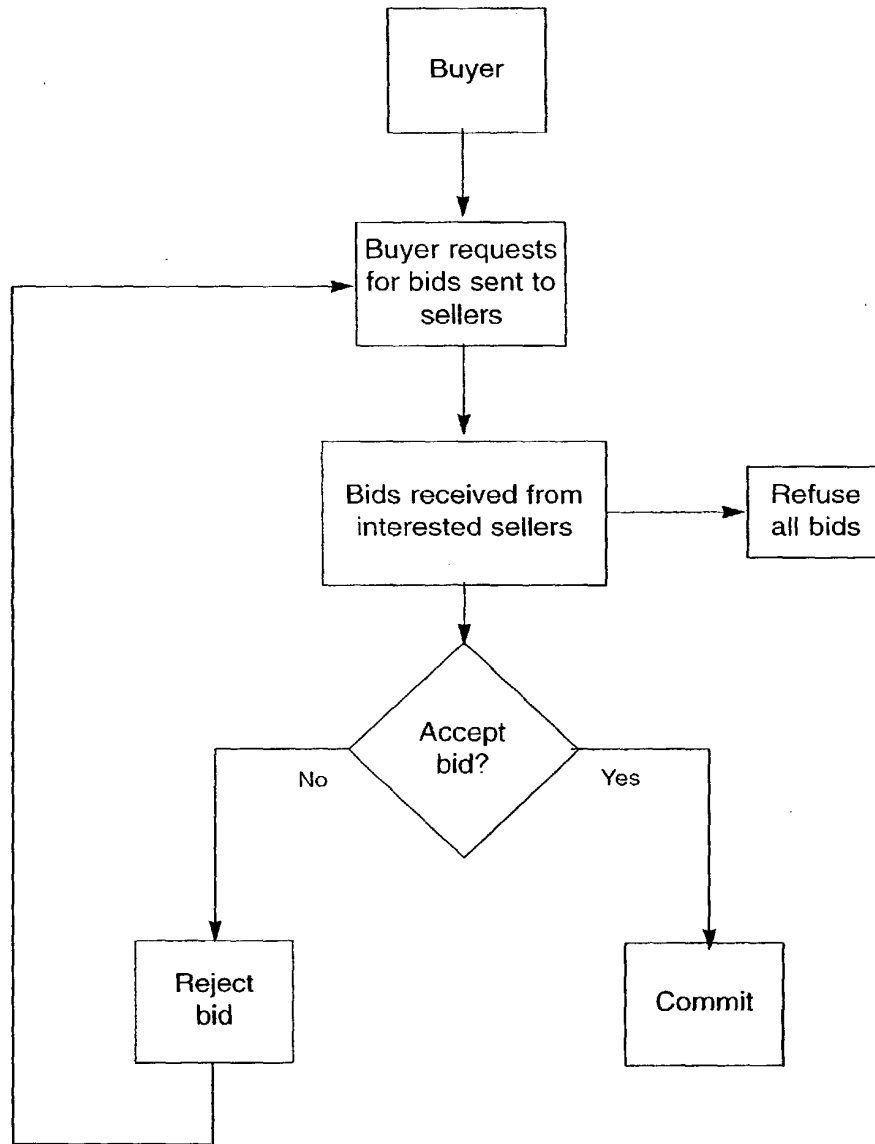
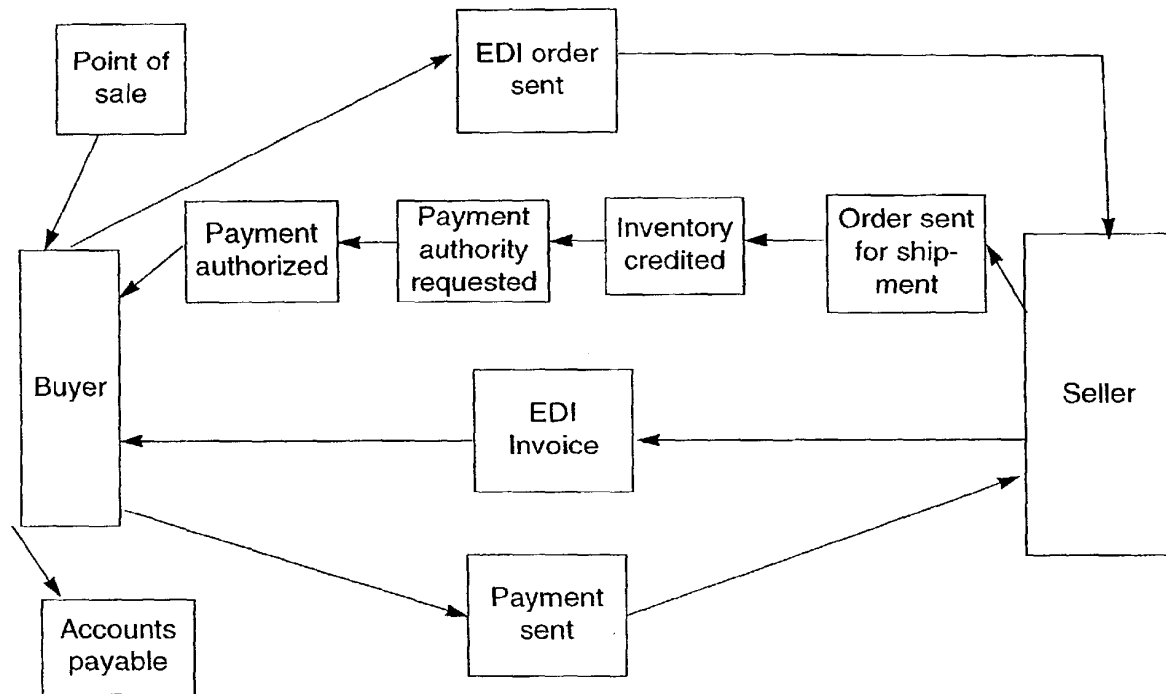


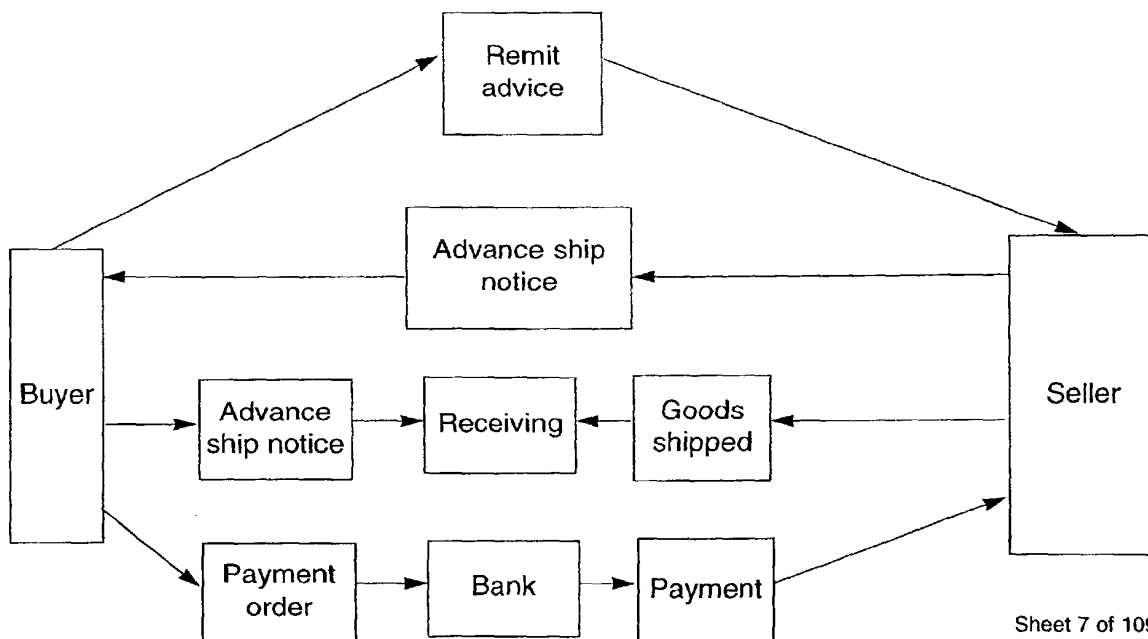
Fig. PA6: Flow Chart Of Contract Net Protocol



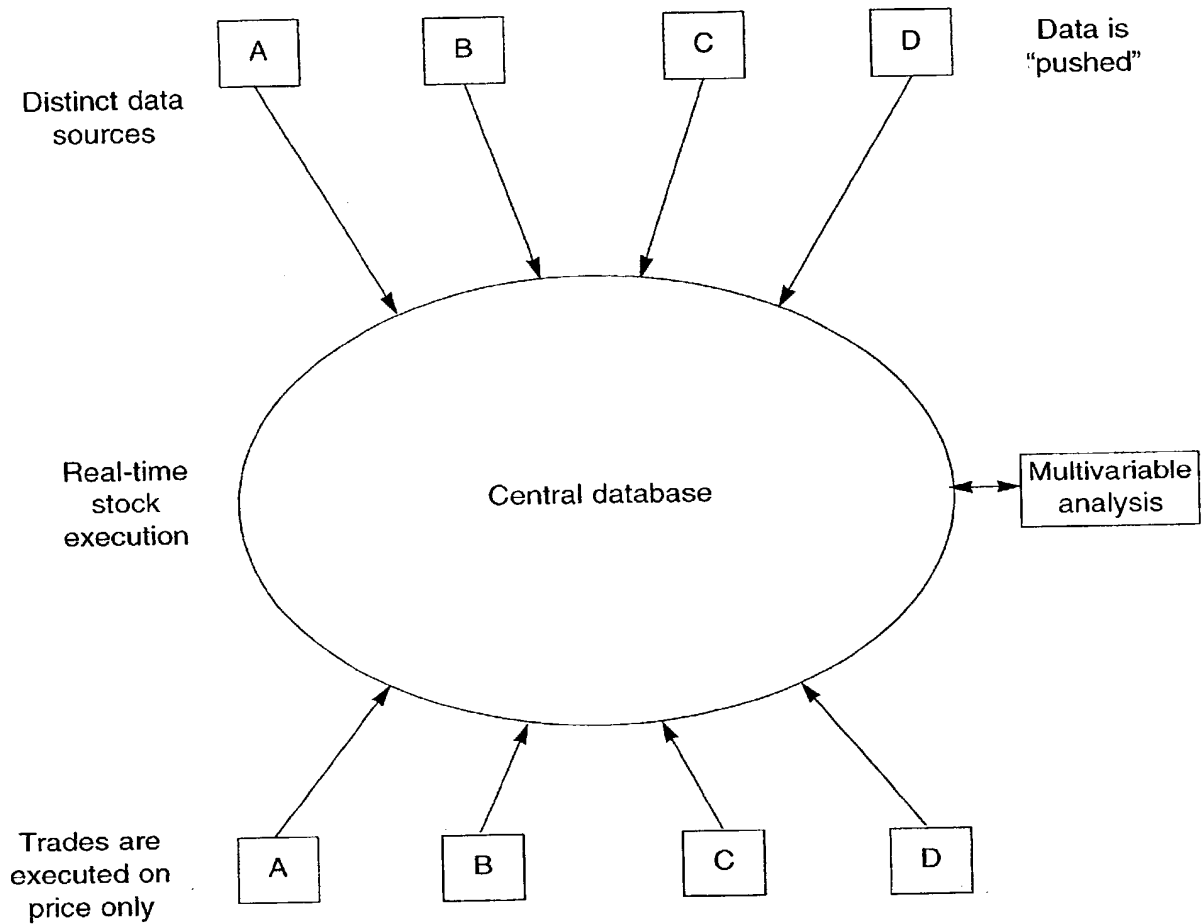
**Fig. PA7A: EDI As A Paper Replacement Technique**



**Fig. PA7B: EDI As A Process Elimination Technique**



**Fig. PA8: ECN (Electronic Communications Network)**





**Fig. PA9A: Intermediated Demand-Initiated Procurement System**

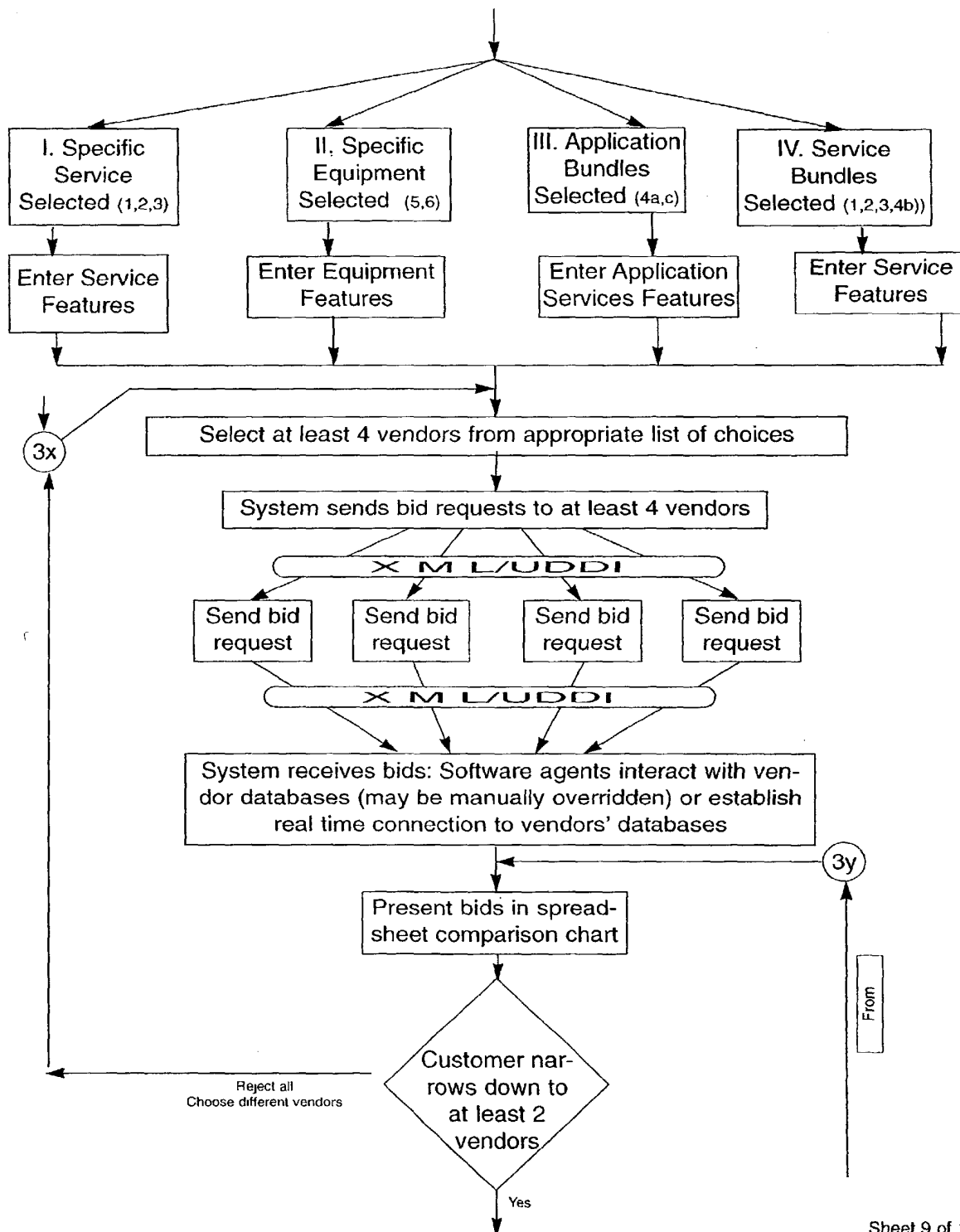
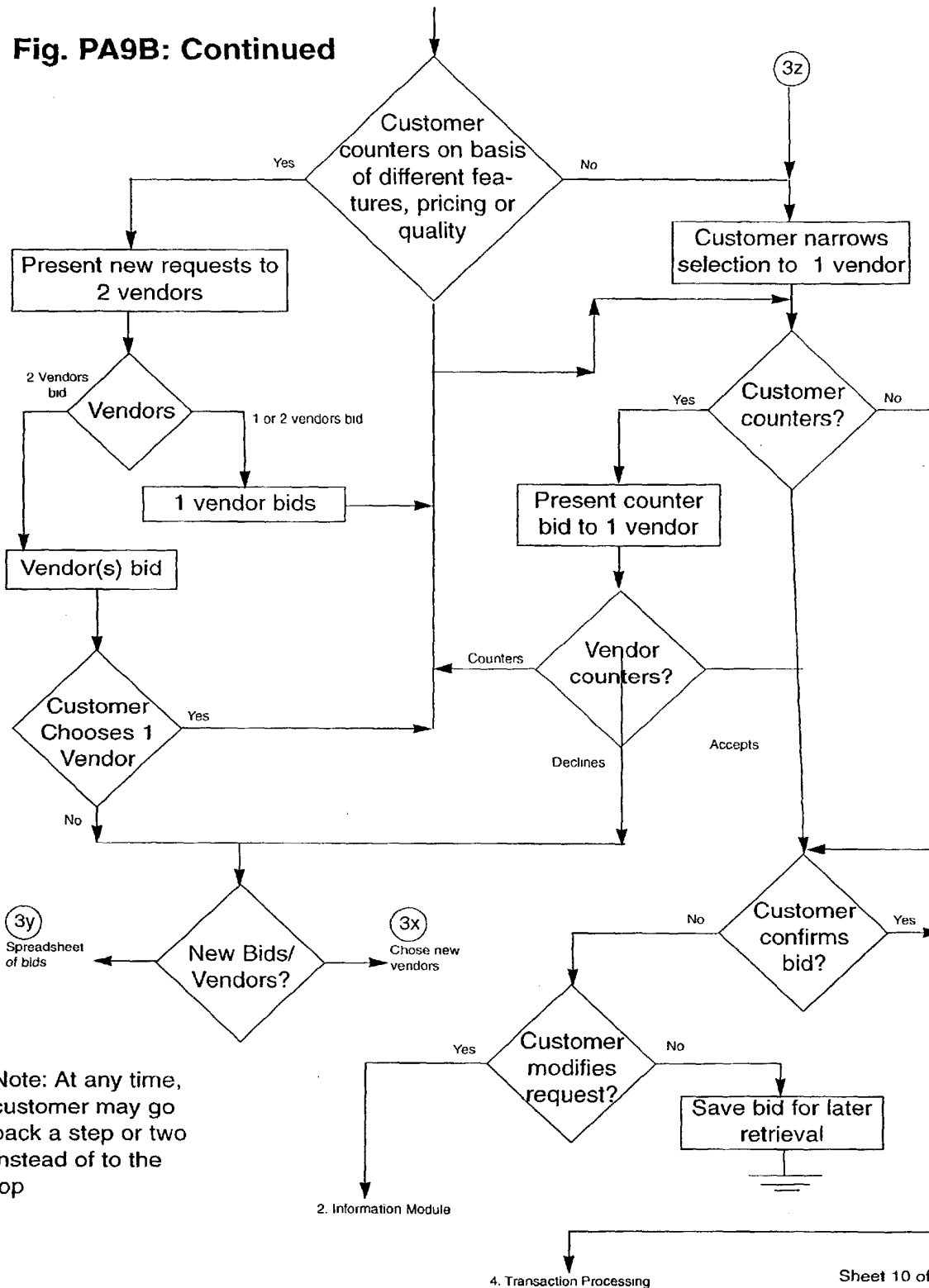


Fig. PA9B: Continued



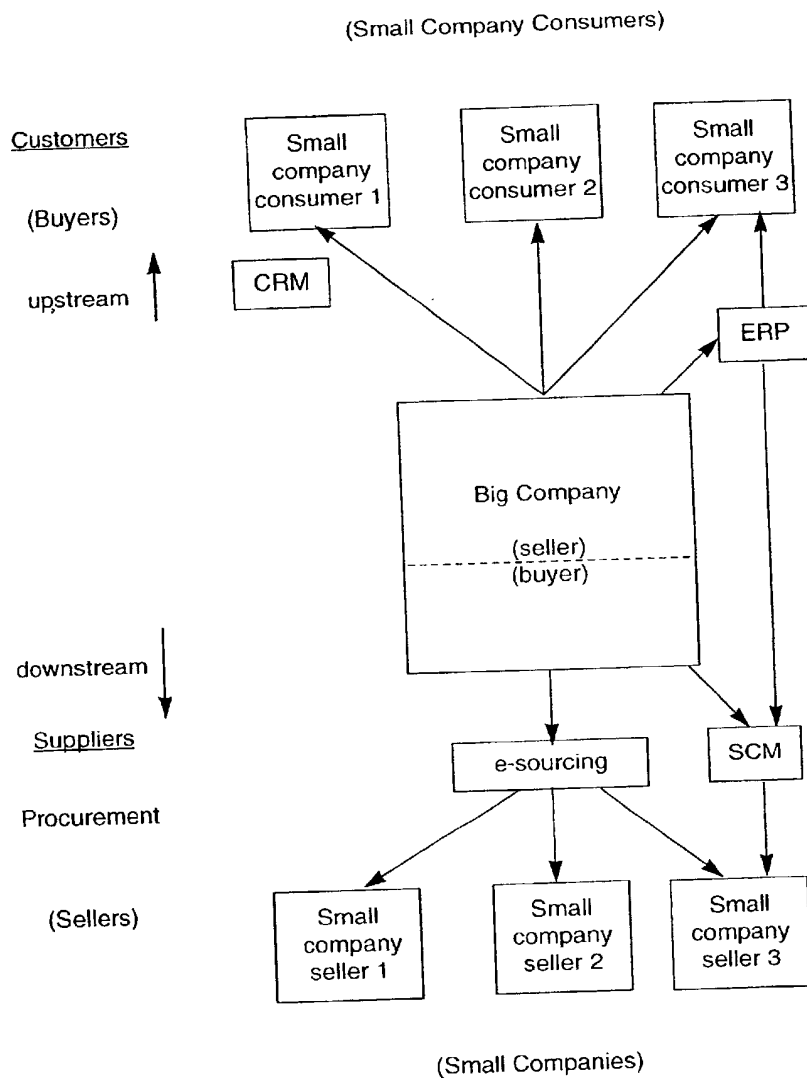
Note: At any time, customer may go back a step or two instead of to the top

2. Information Module

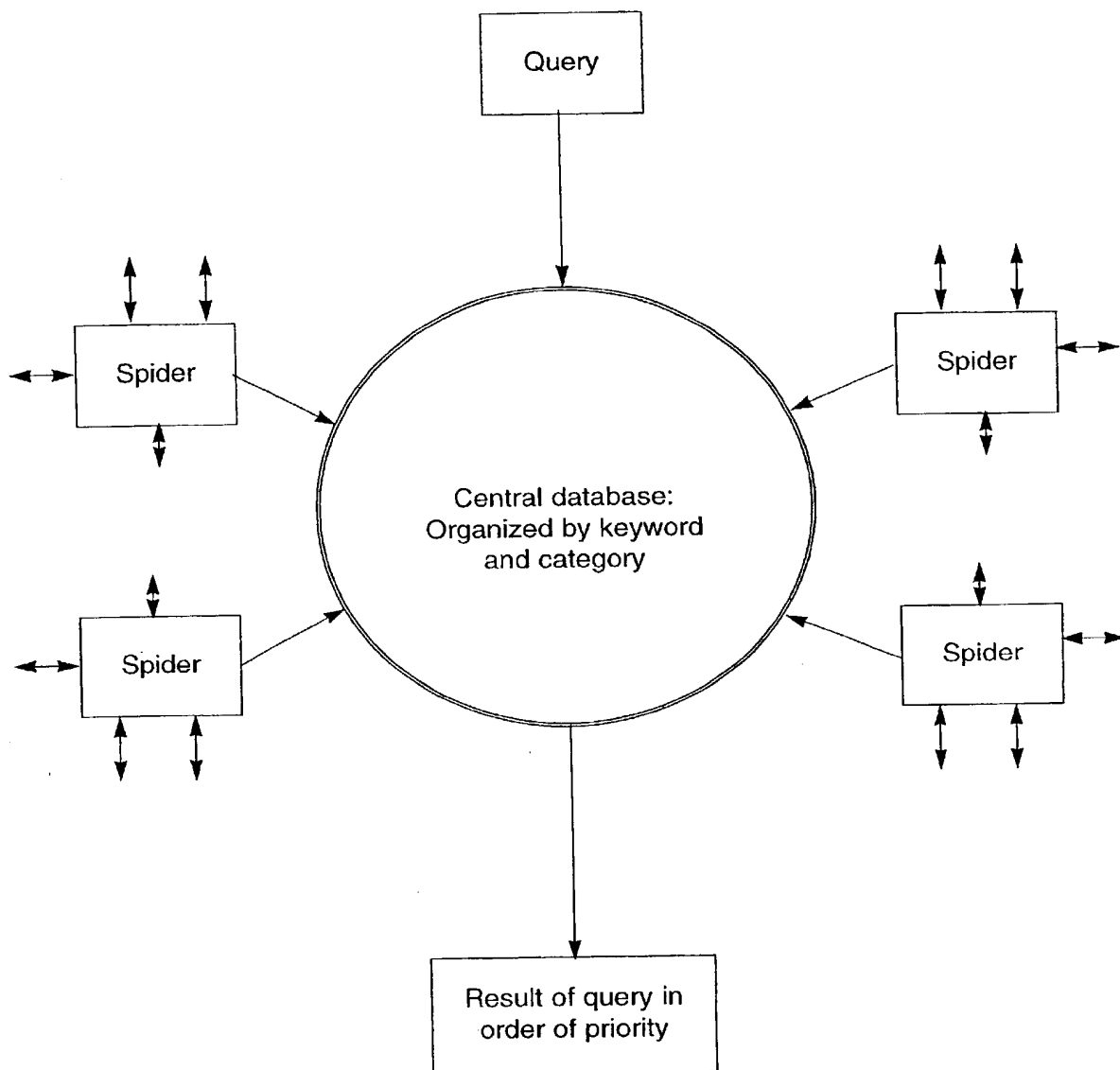
4. Transaction Processing

Sheet 10 of 109

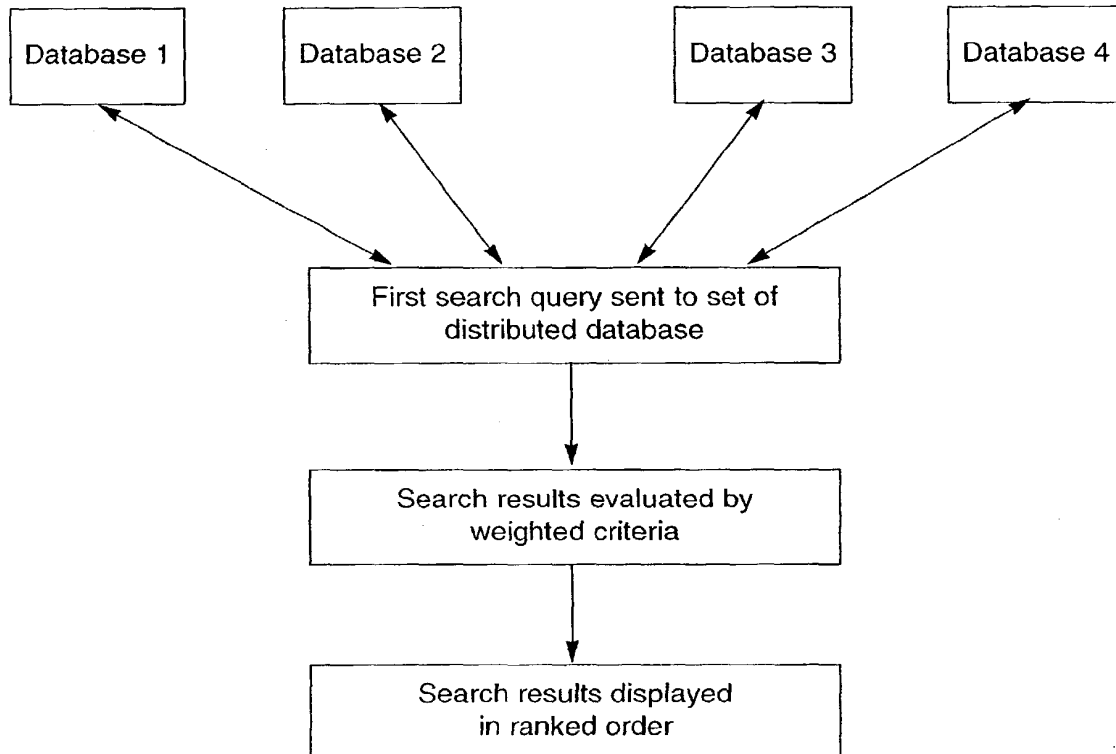
# Fig. PA10: Traditional Supply Chain & Customer Relationships



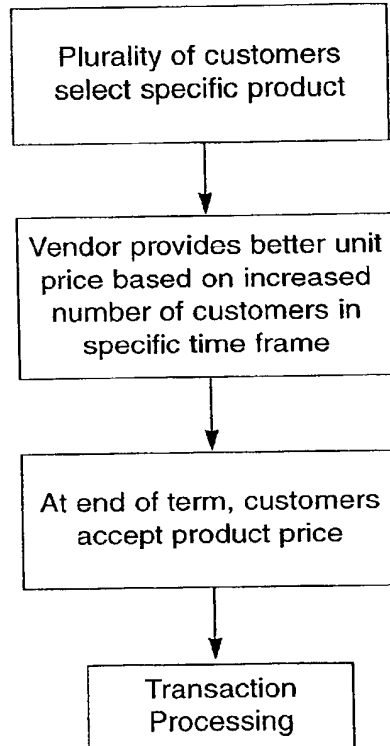
**Fig. PA11: Traditional Search Technology**



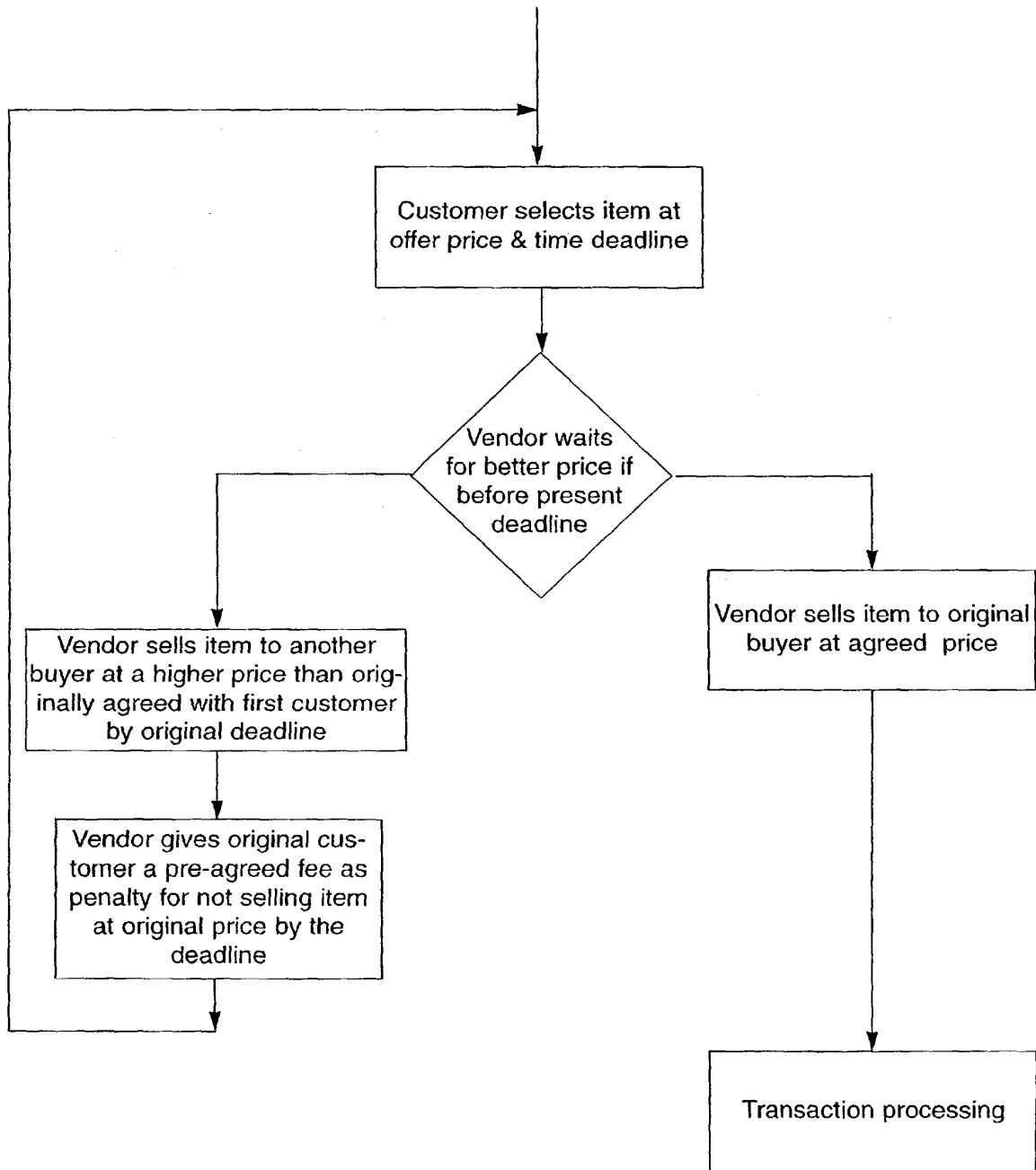
**Fig. PA12: Distributed Search Approach**



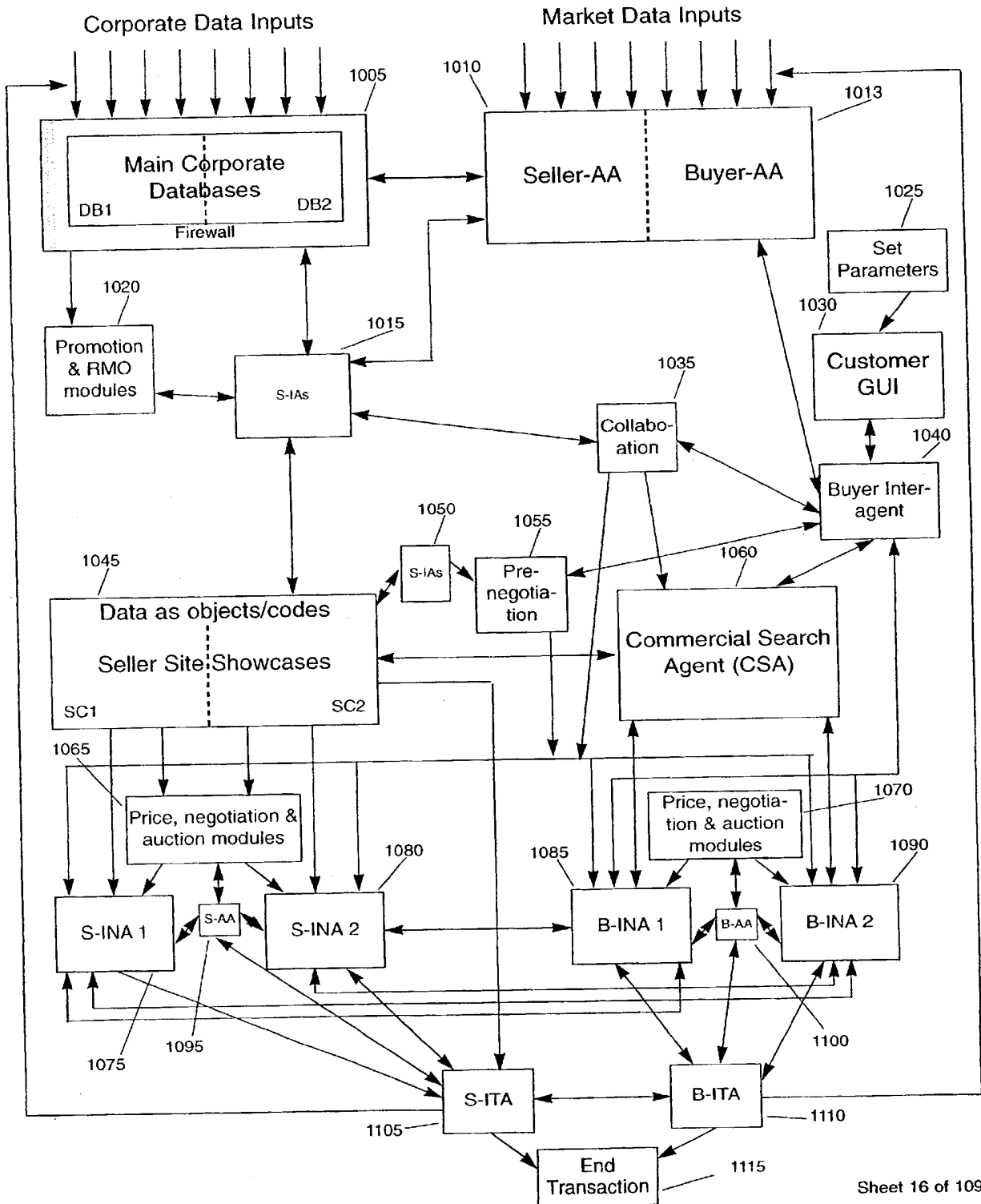
**Fig. PA13: Traditional Aggregation**



**Fig. PA14: Intermediated Option Contracts**

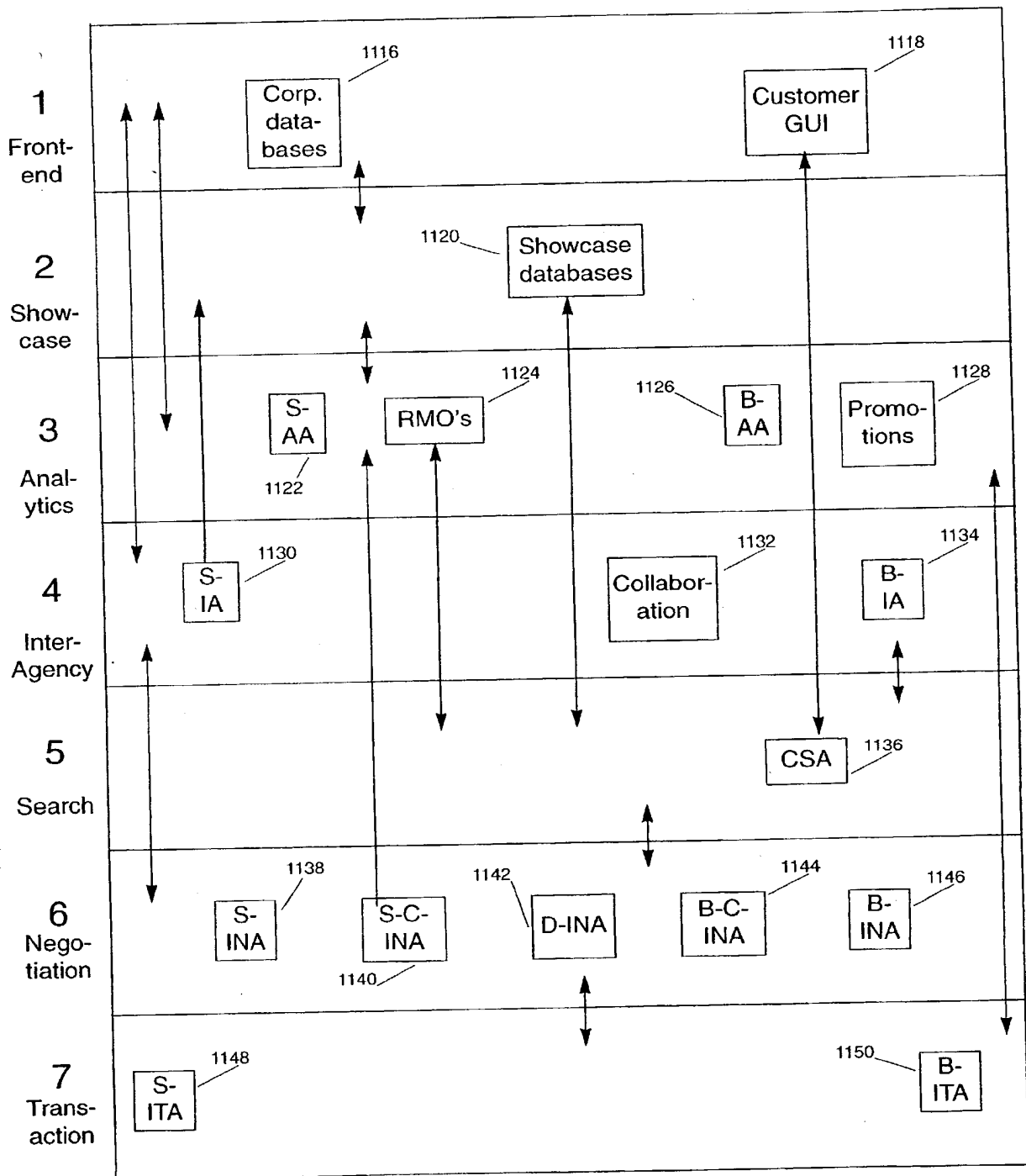


**Fig. 1: CCN Architecture**

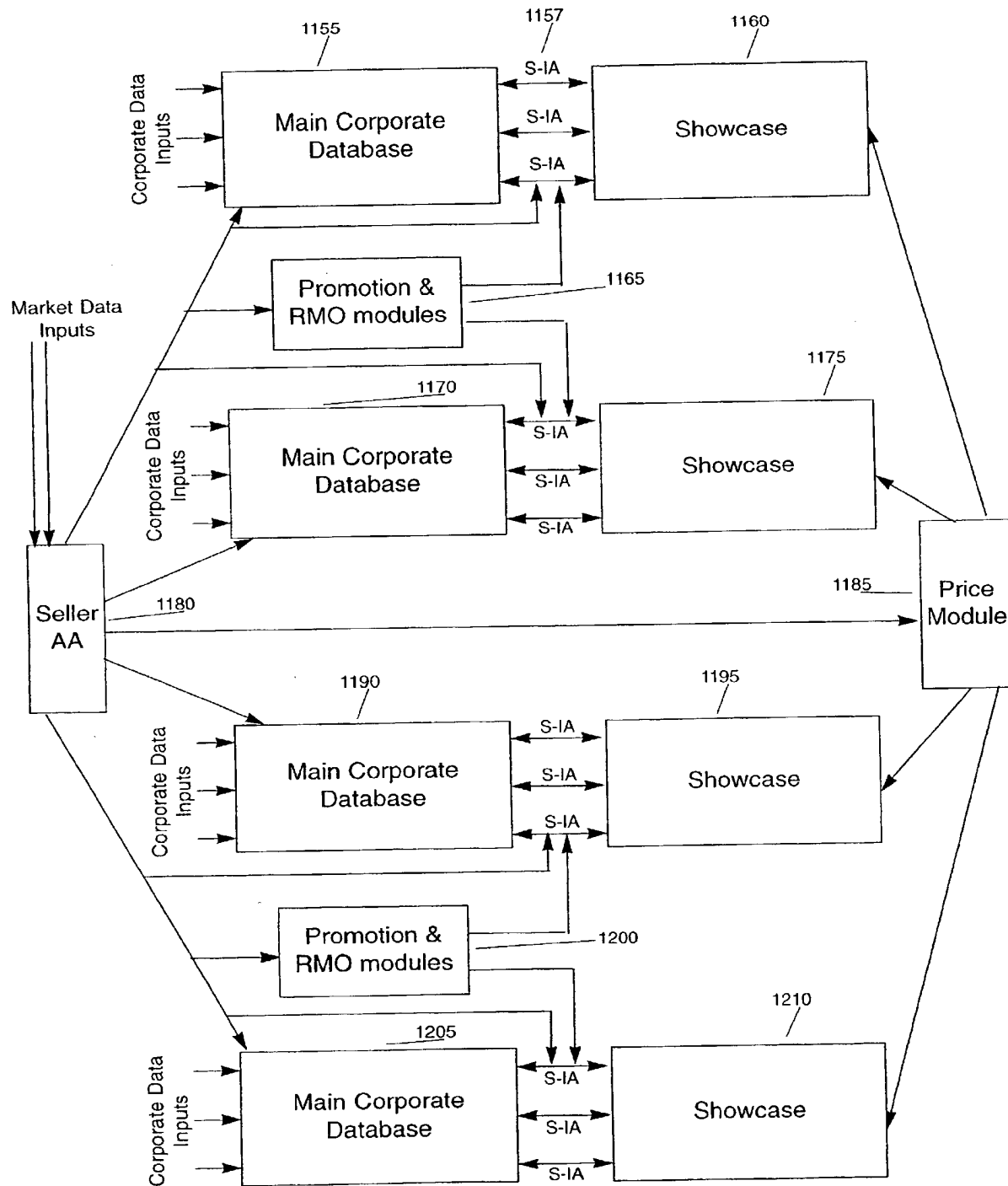




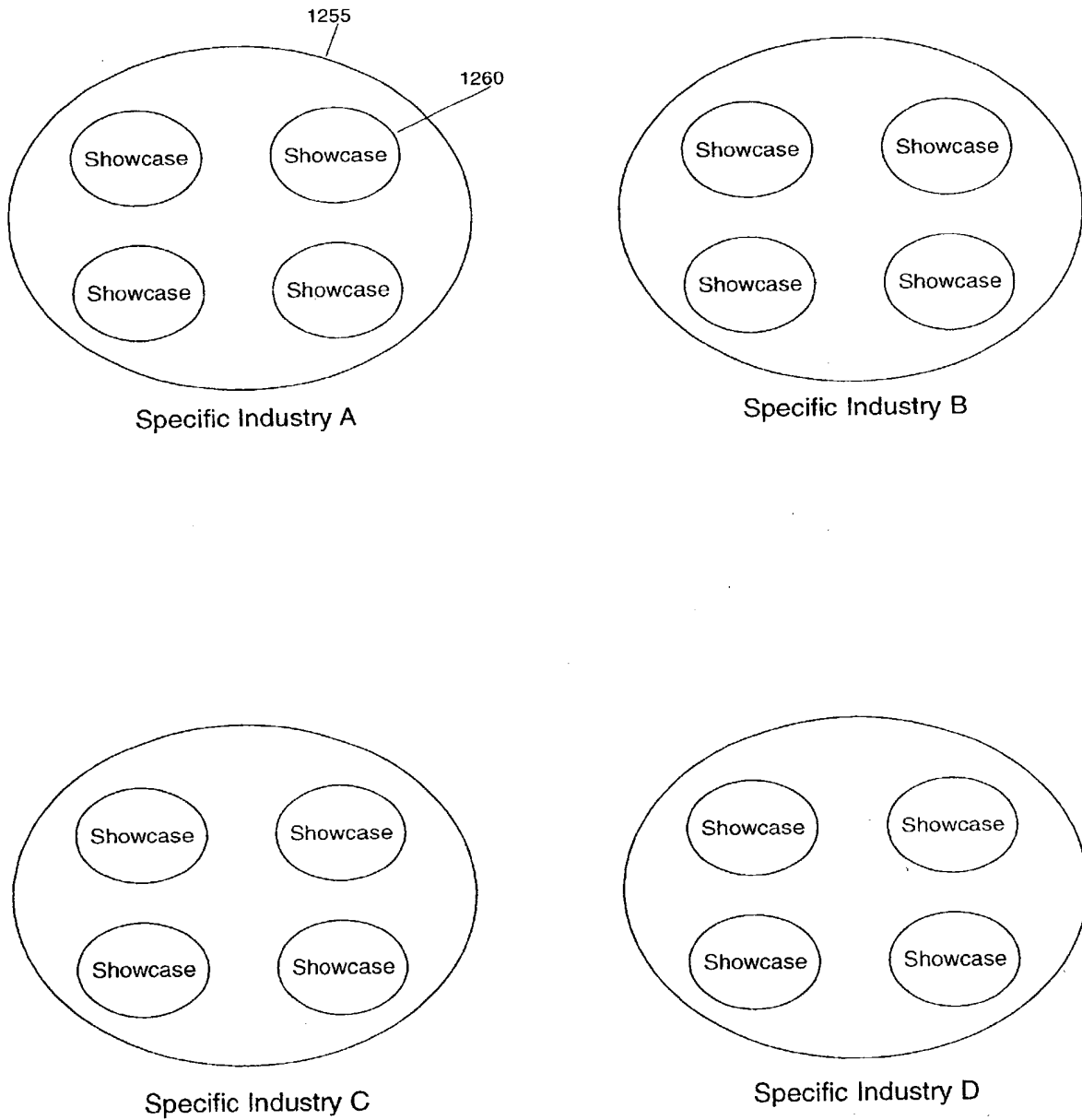
**Fig. 2: CCN System Layers**



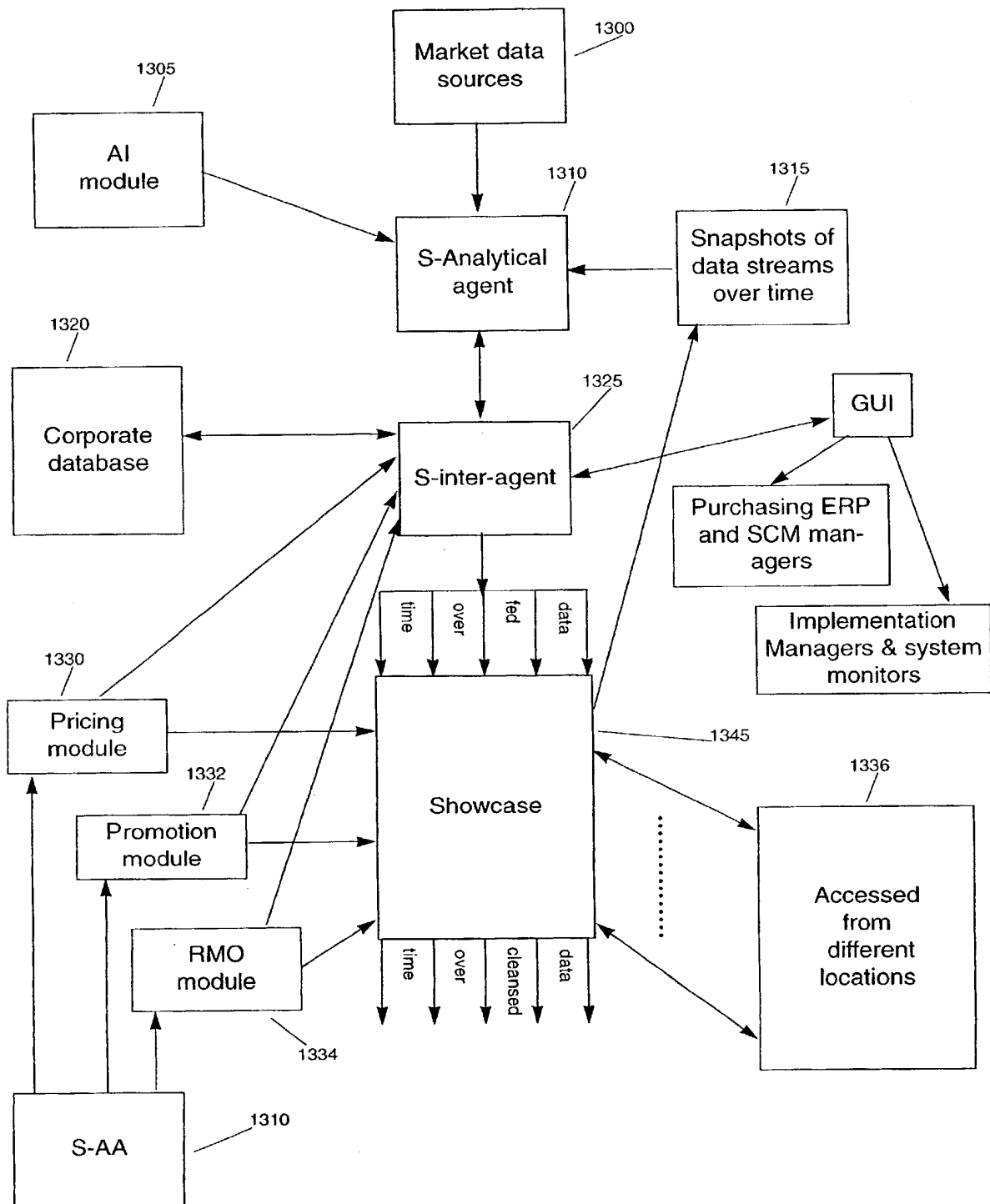
**Fig. 3: Showcase Database System**



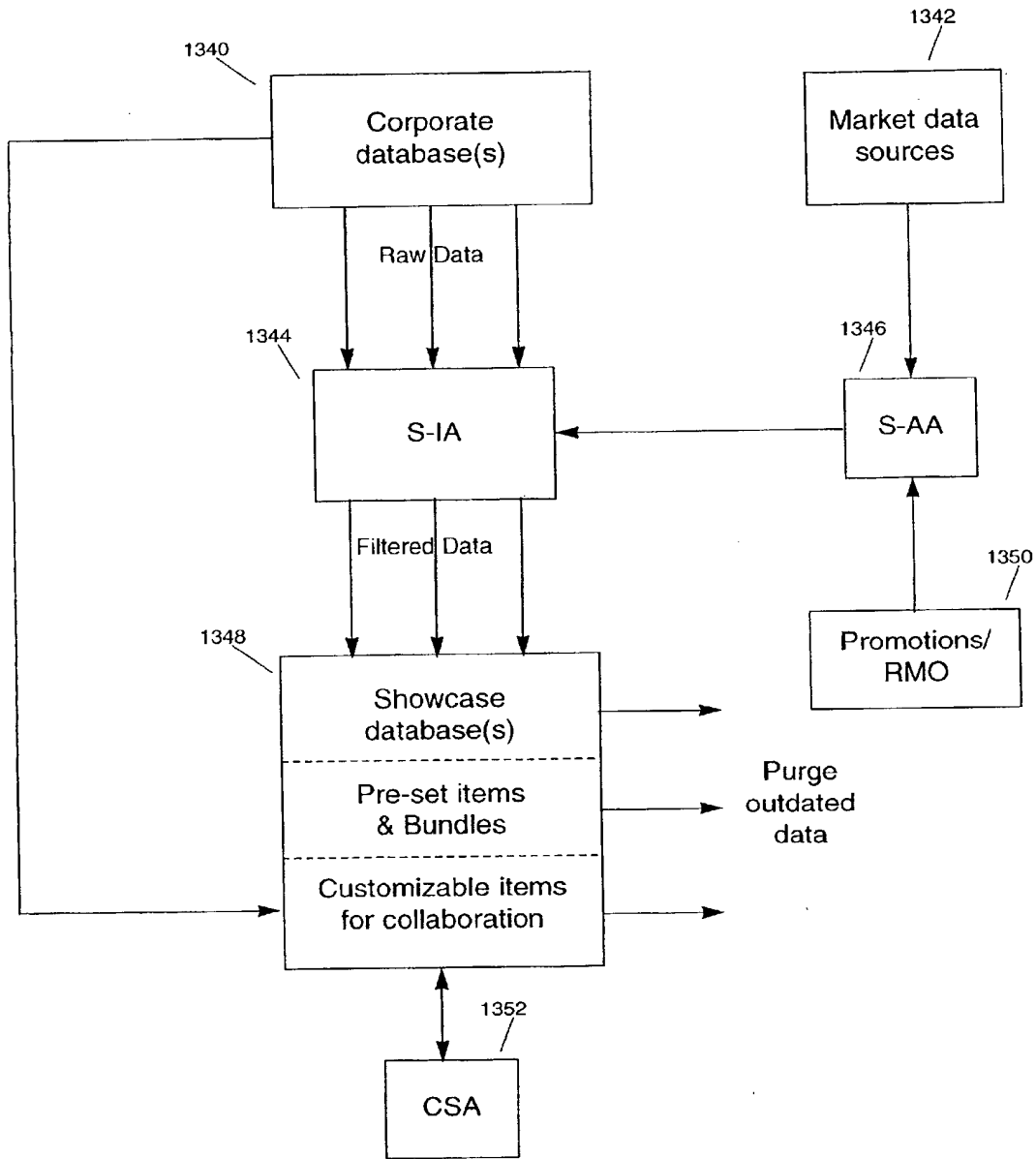
**Fig. 4: Multiple Vertical Databases**



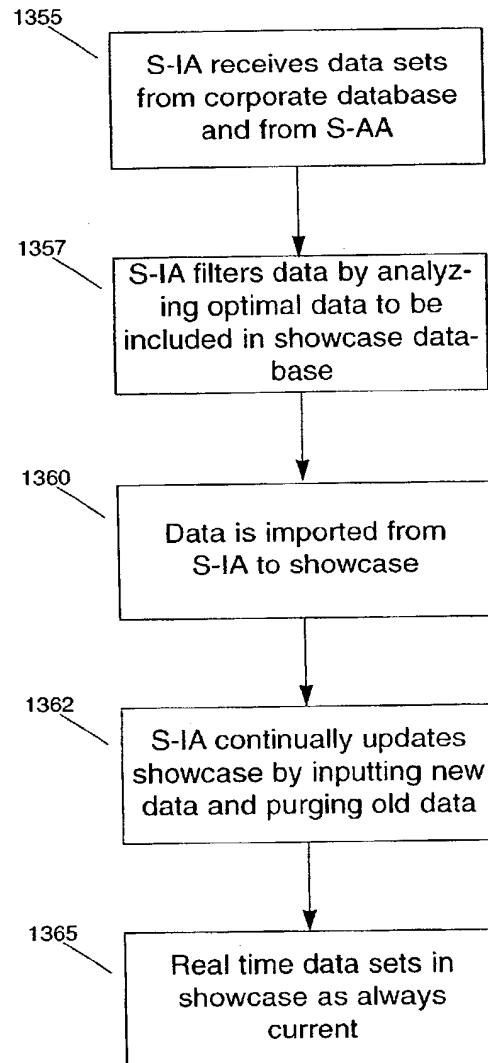
**Fig. 5: Showcase Database View**



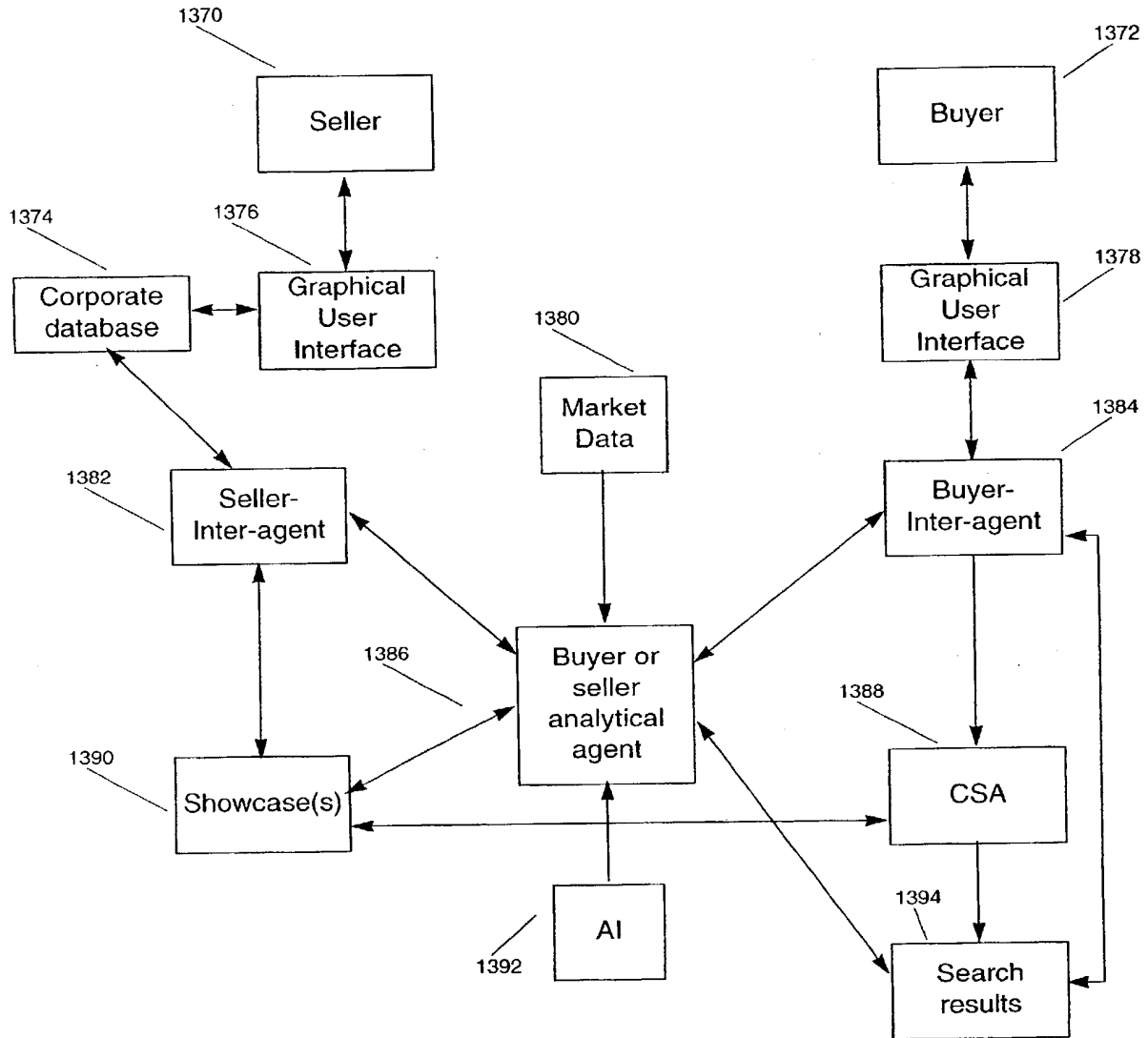
**Fig. 6: Showcase Database Operation**



**Fig. 7: Showcase Data Flow**



**Fig. 8: Inter-agent System Architecture**



**Fig. 9: Rivers of Data Flows**

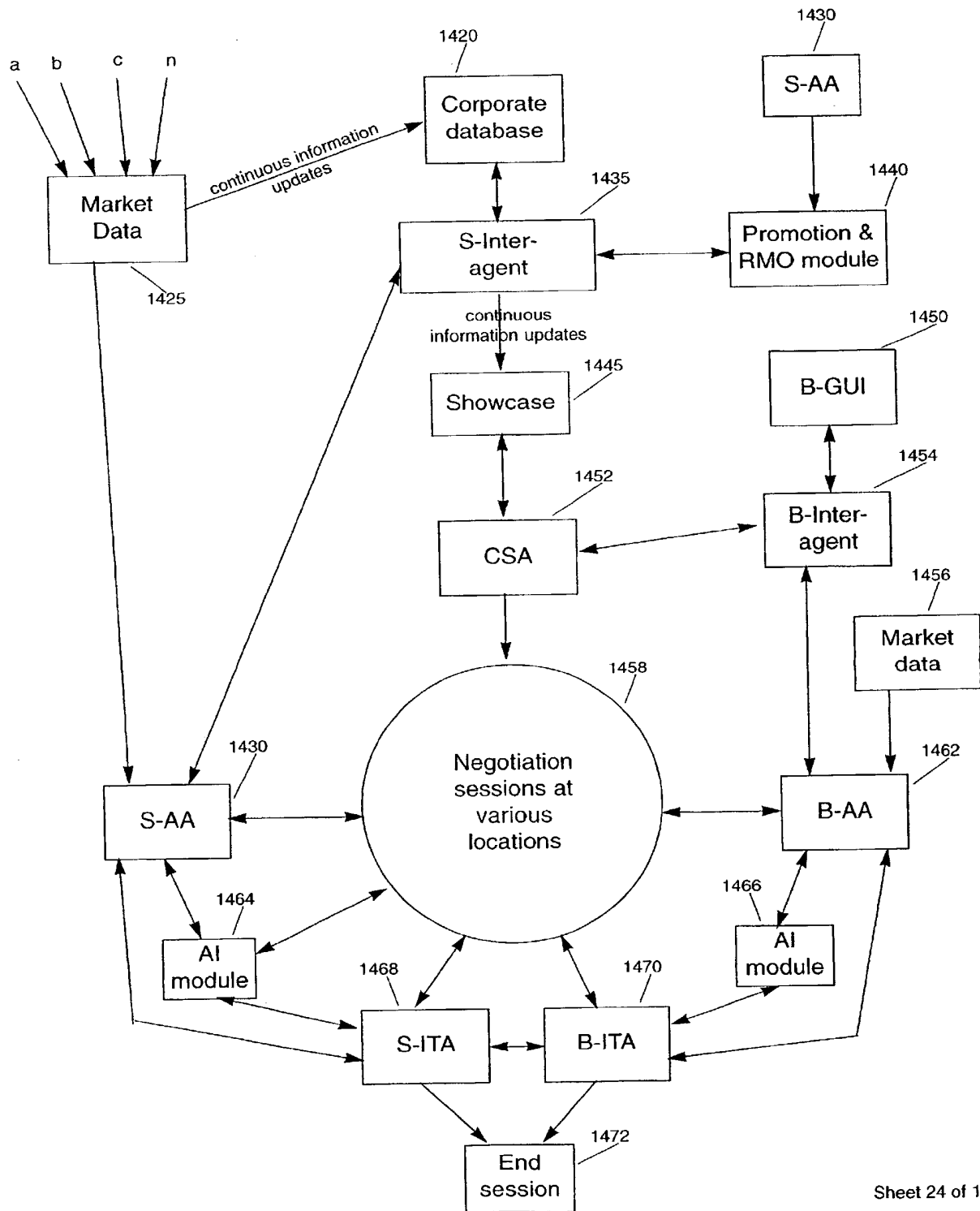




Fig. 10: CSA System Architecture

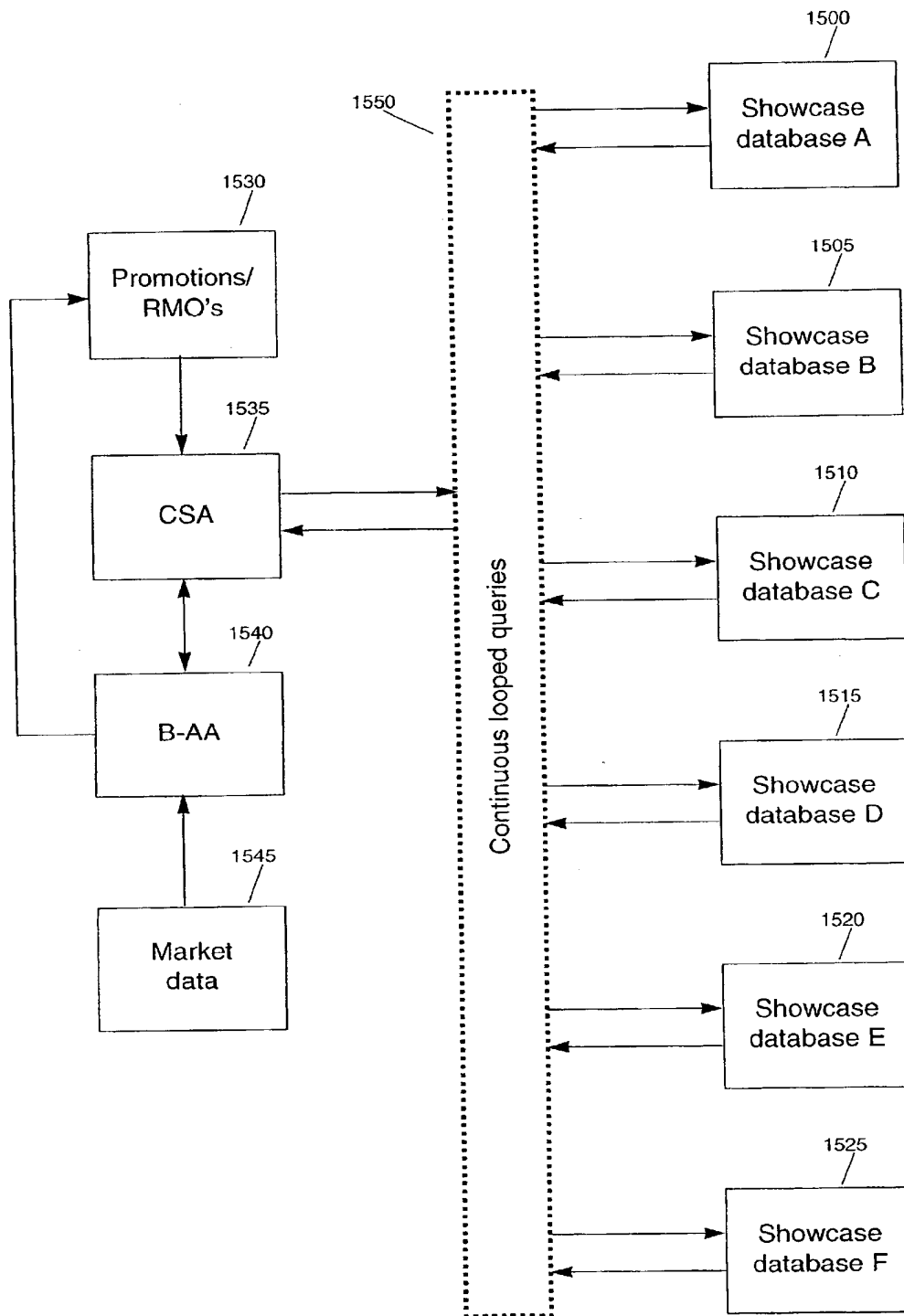


Fig. 11: CSA First Query Sequence

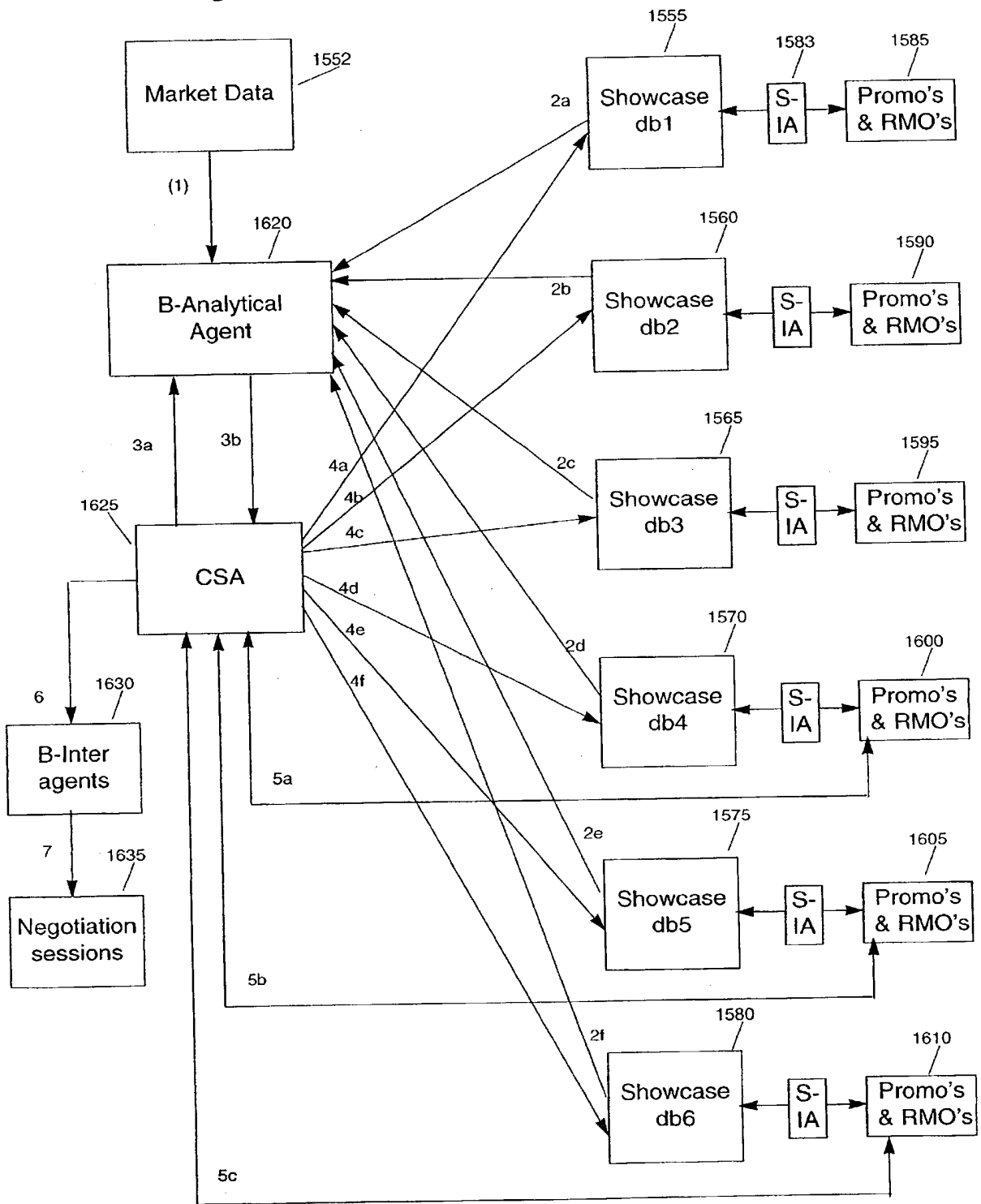
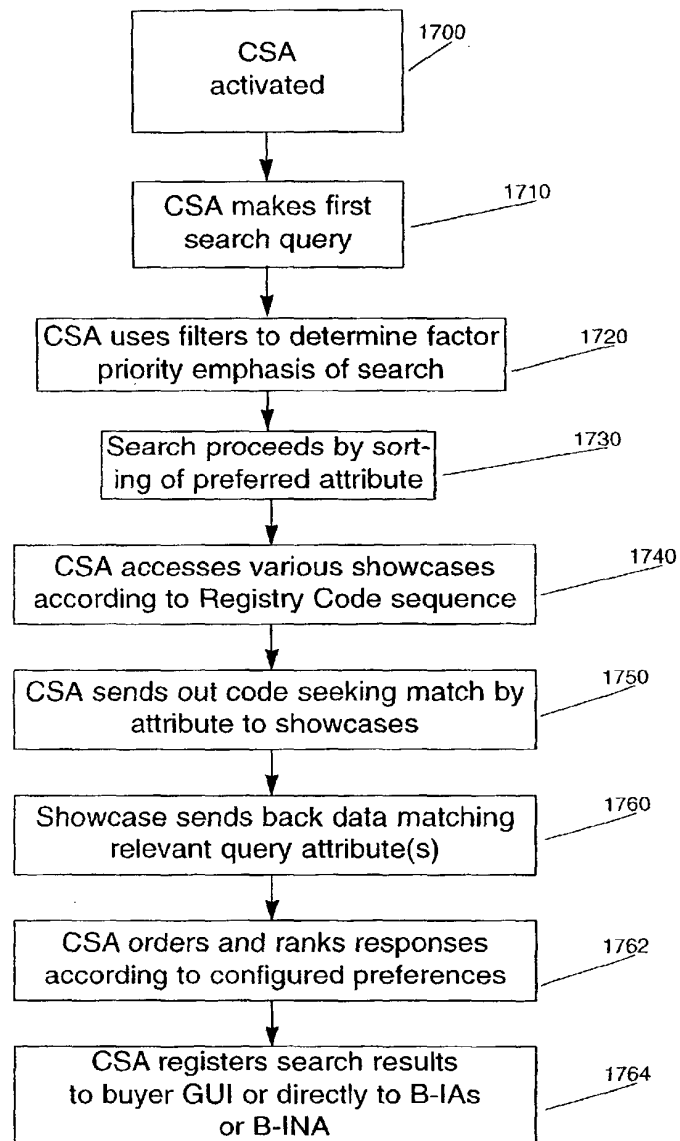
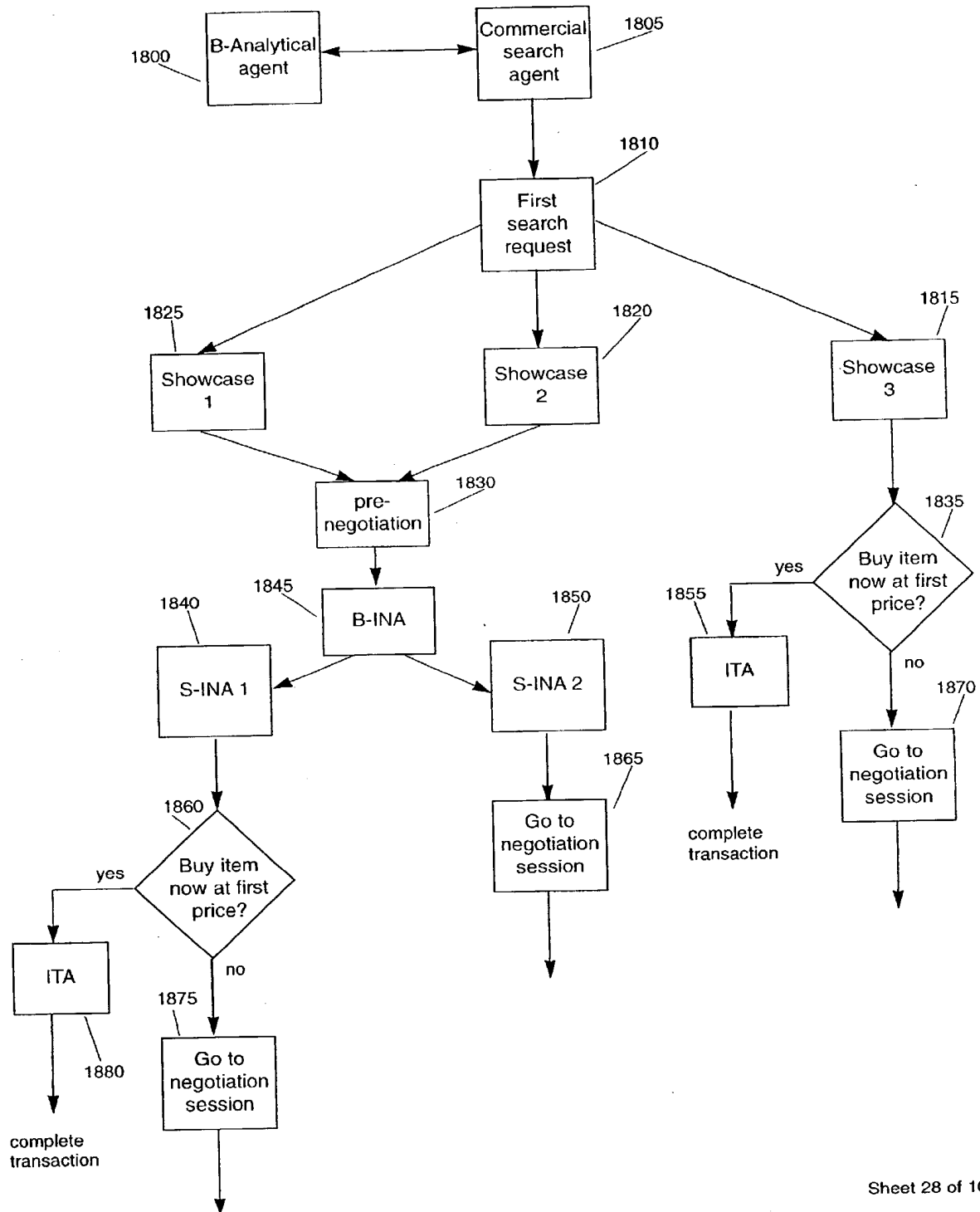


Fig. 12: Programmability of CSAs for Priorities of Search



**Fig. 13: CSA As Initial Search Query**



**Fig. 14: CSA Filters**

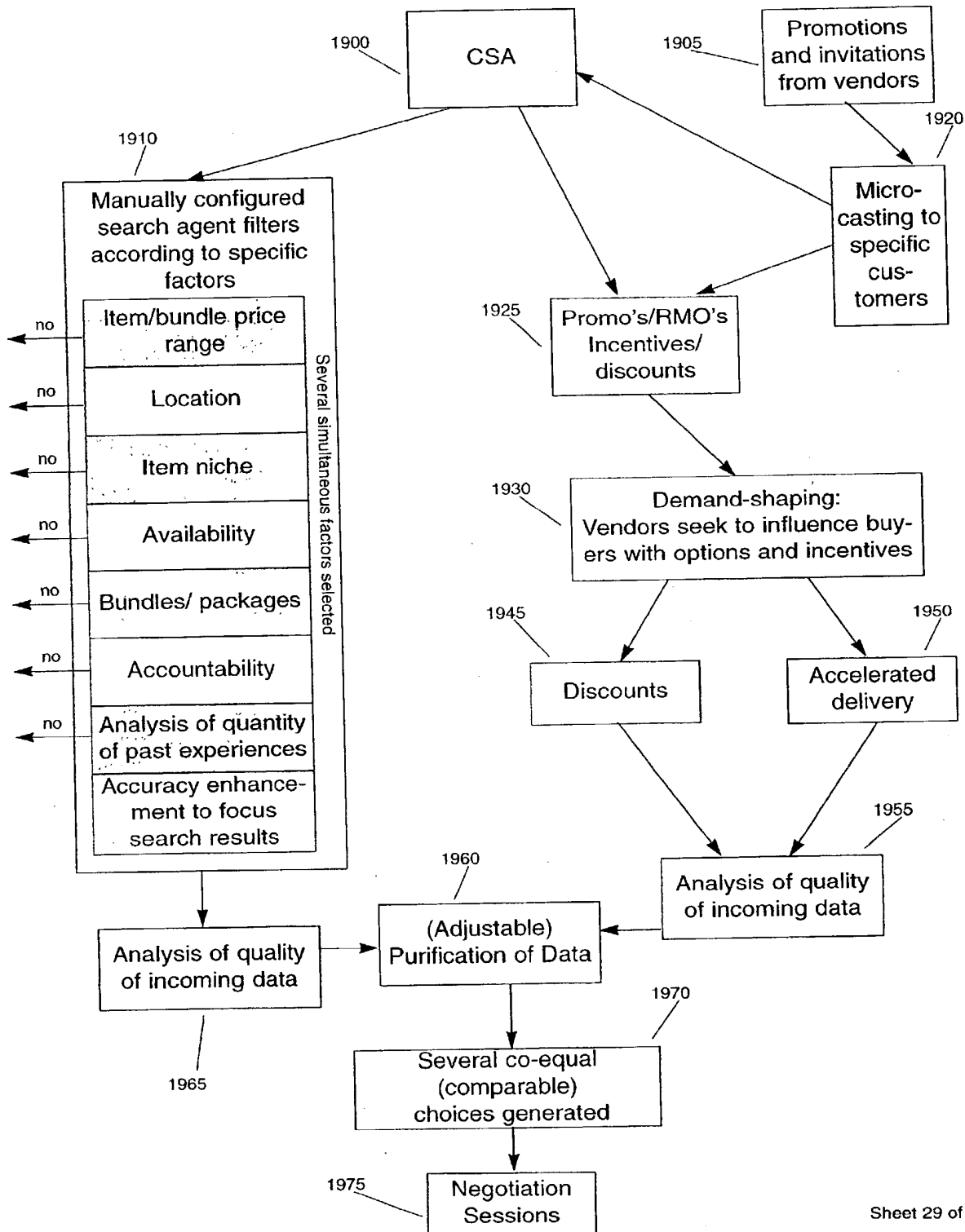
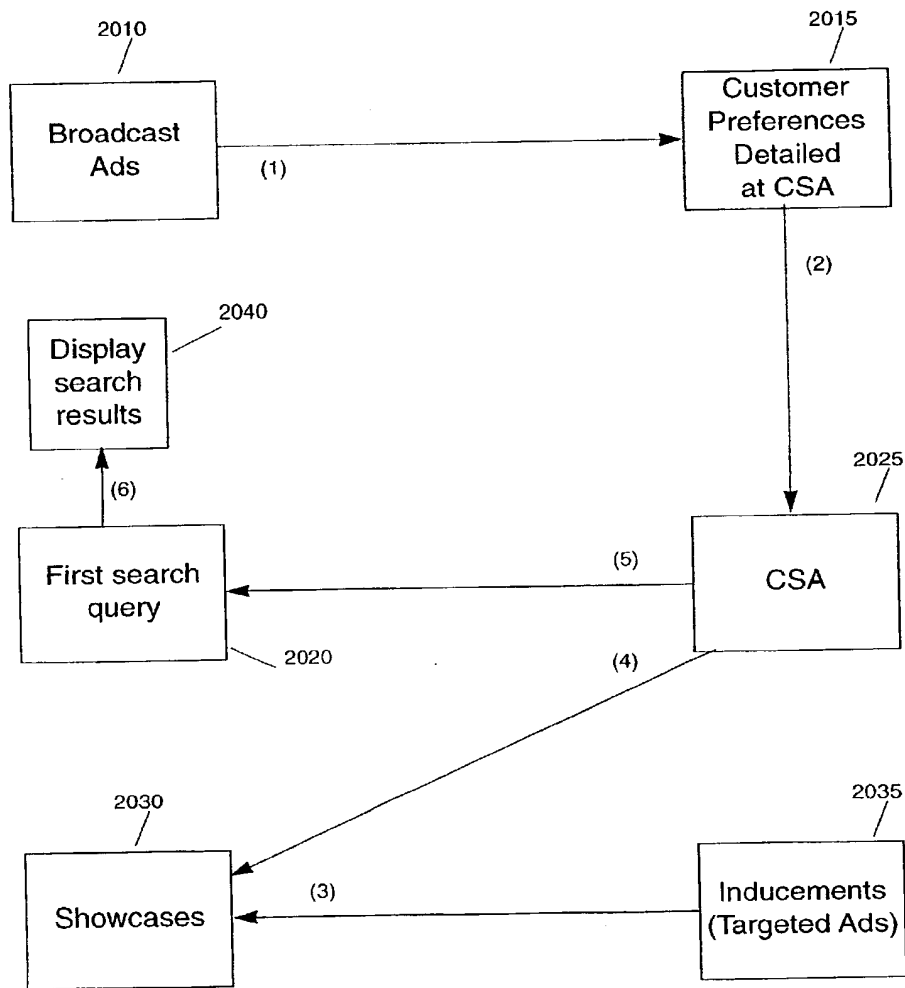


Fig. 15: Promotions



**Fig. 16: Proximity Marketing For Mobile INAs**

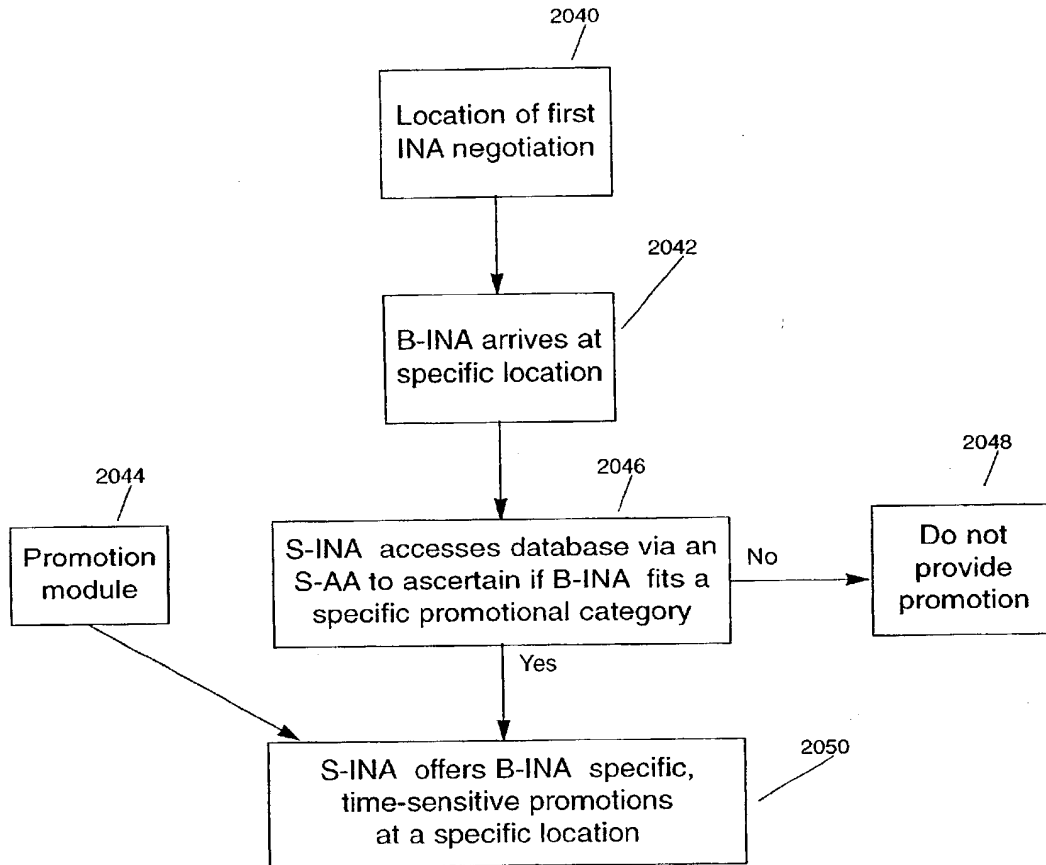
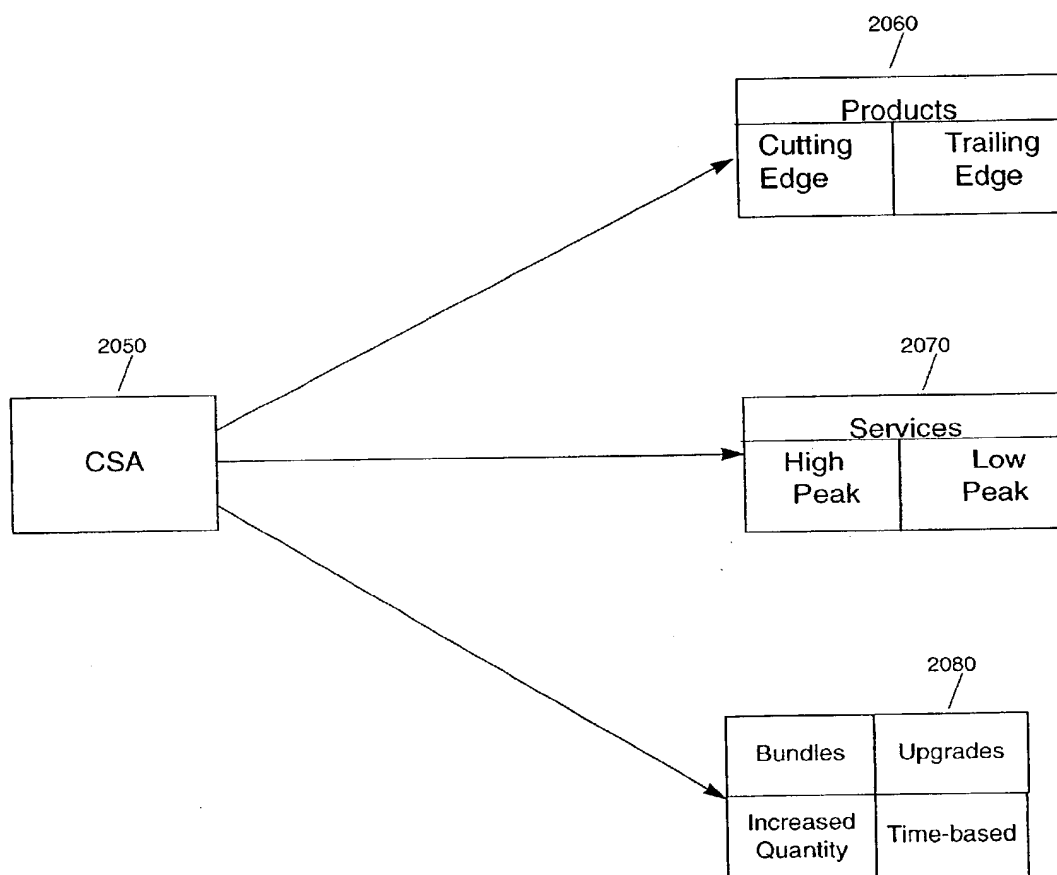


Fig. 17: Promotional Discounting

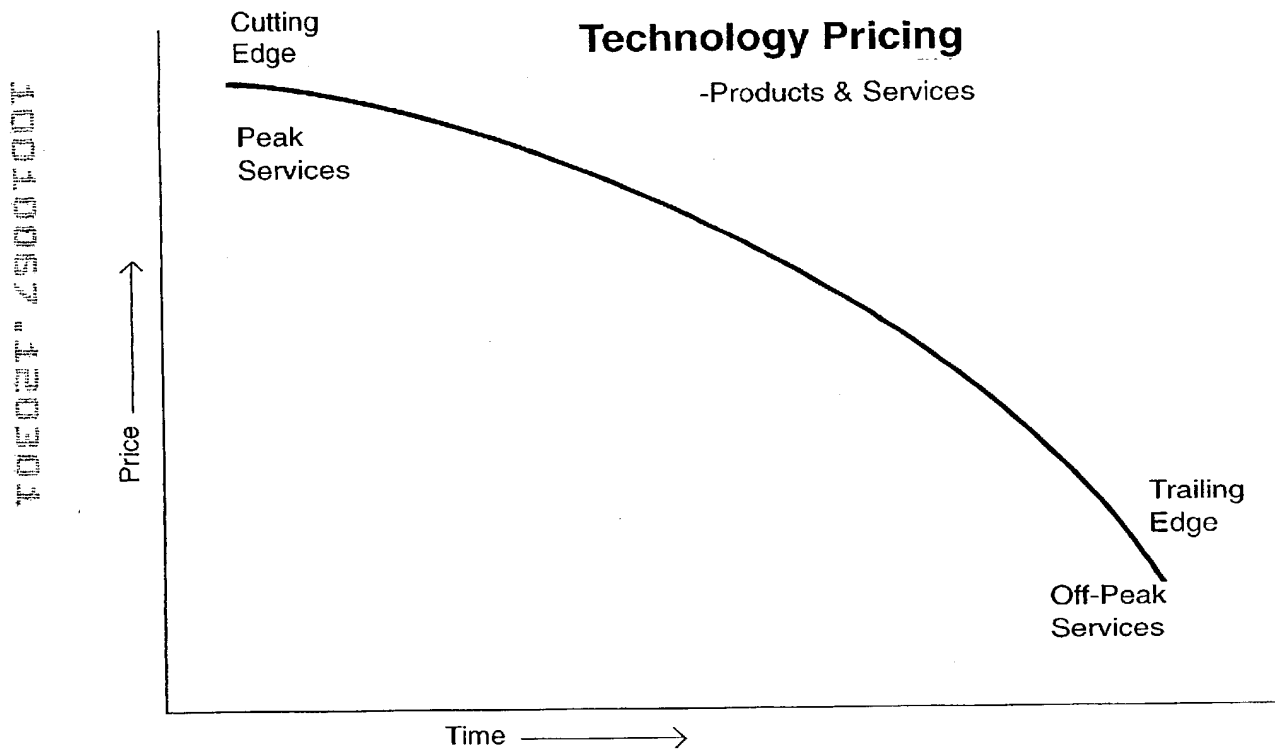




**Fig. 18: Dynamic Pricing Model**

**Conditions:**

- Product cycle rate
- Market/Economy
- Competition



## Fig. 19: Pricing Discount Promotions

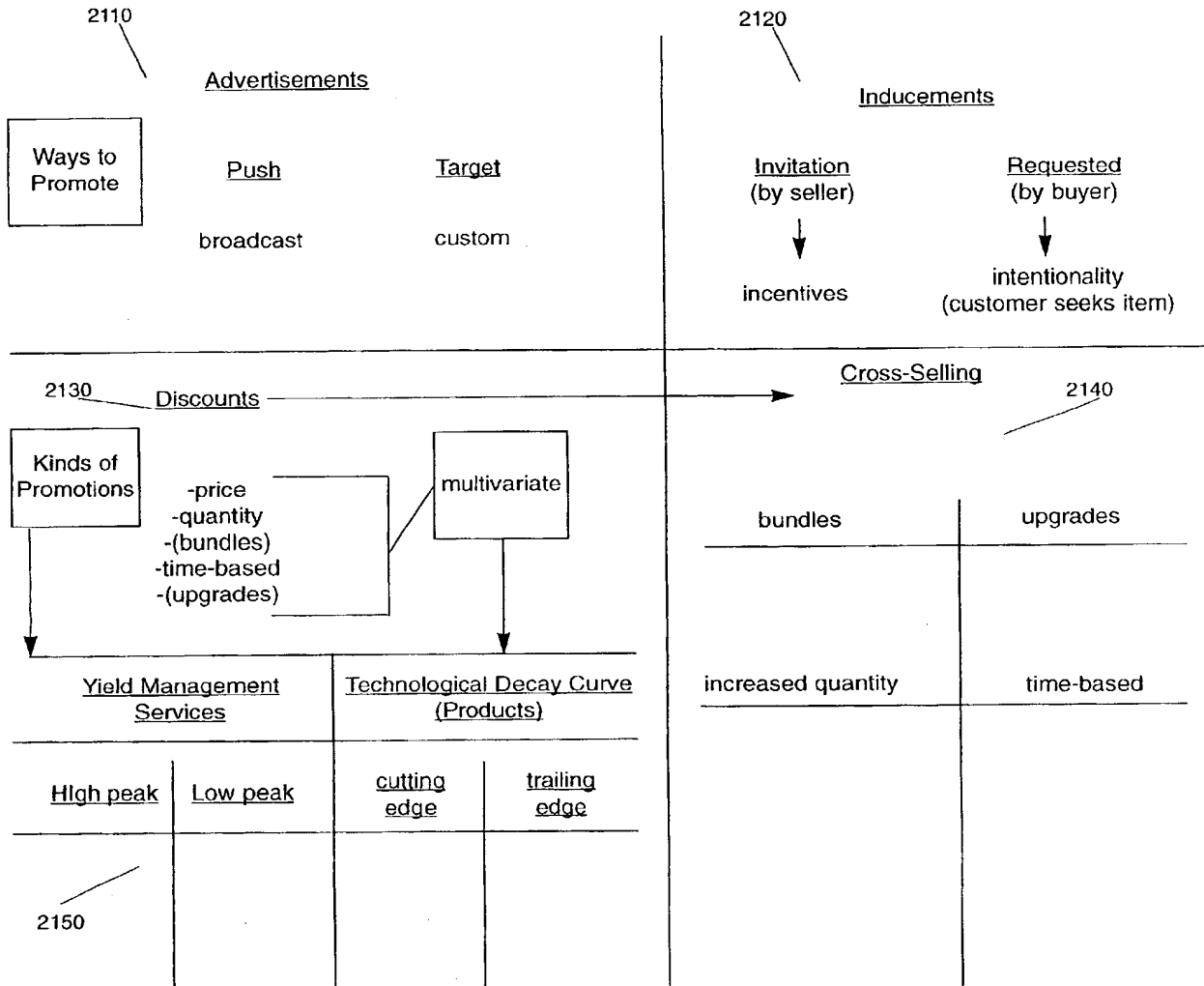
### Dropping Prices Tendency

1. Trailing edge technology
2. Off-peak service
3. Bundled packages (aggregation-discounts)
4. Surplus items
5. Decreasing quality
6. Quantity discount (multiple identical items)
8. Un-time-sensitive
9. Decreased features
10. Exploding (Time-sensitive) offers

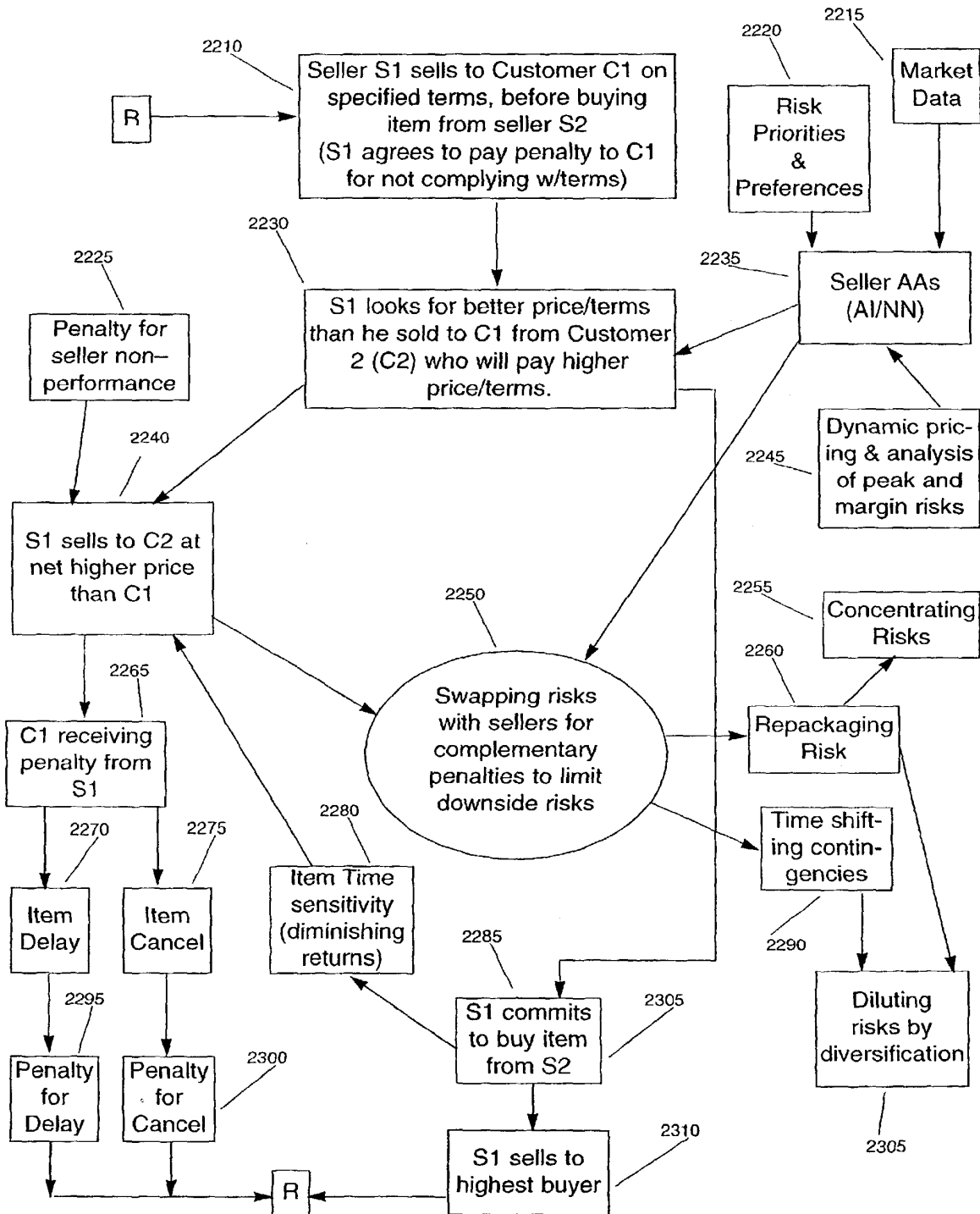
10010067, 1202301

**Fig. 20: Promotions Integrated with CSA & Showcase**

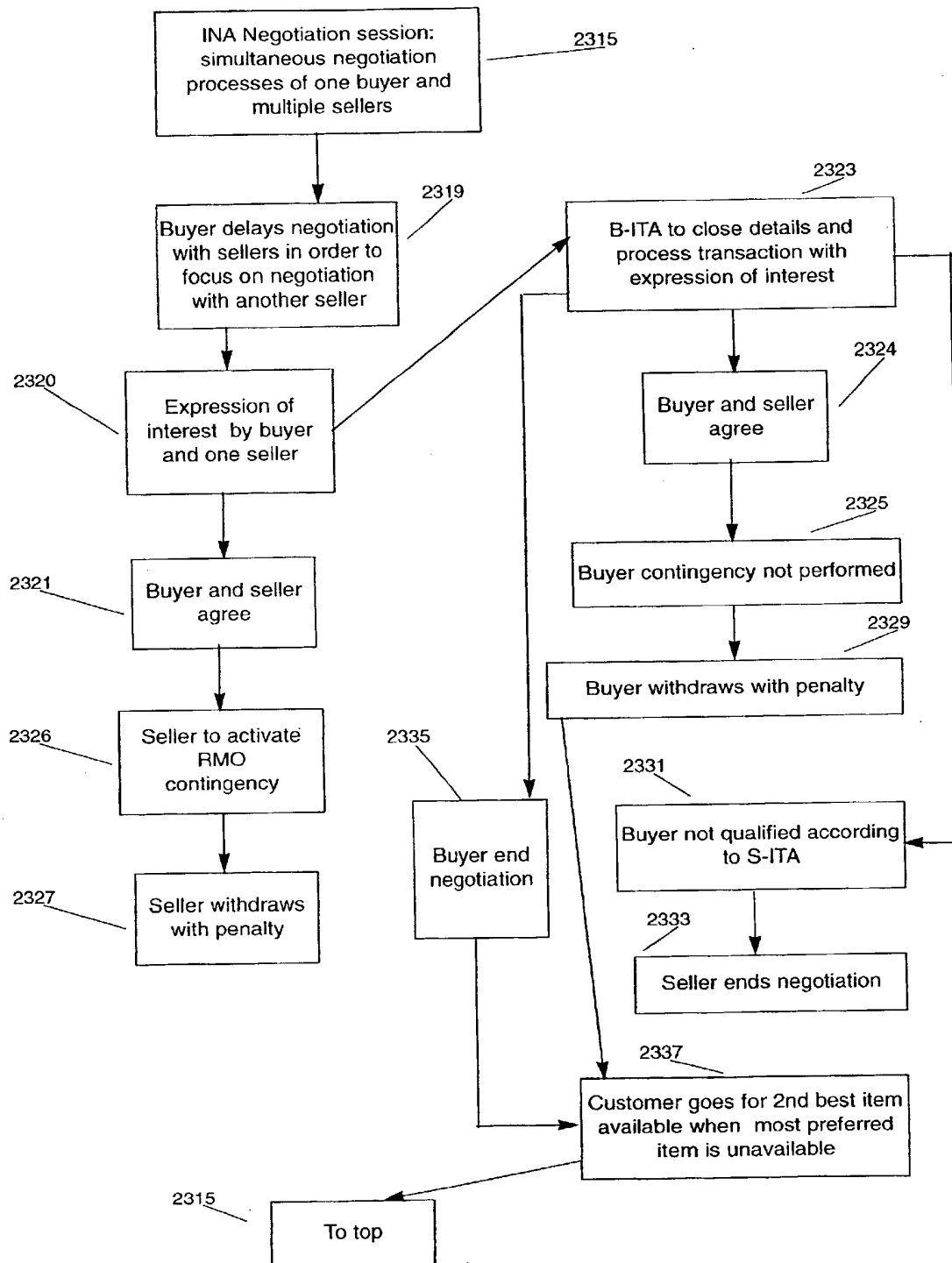
Transaction based vs. Relationship based



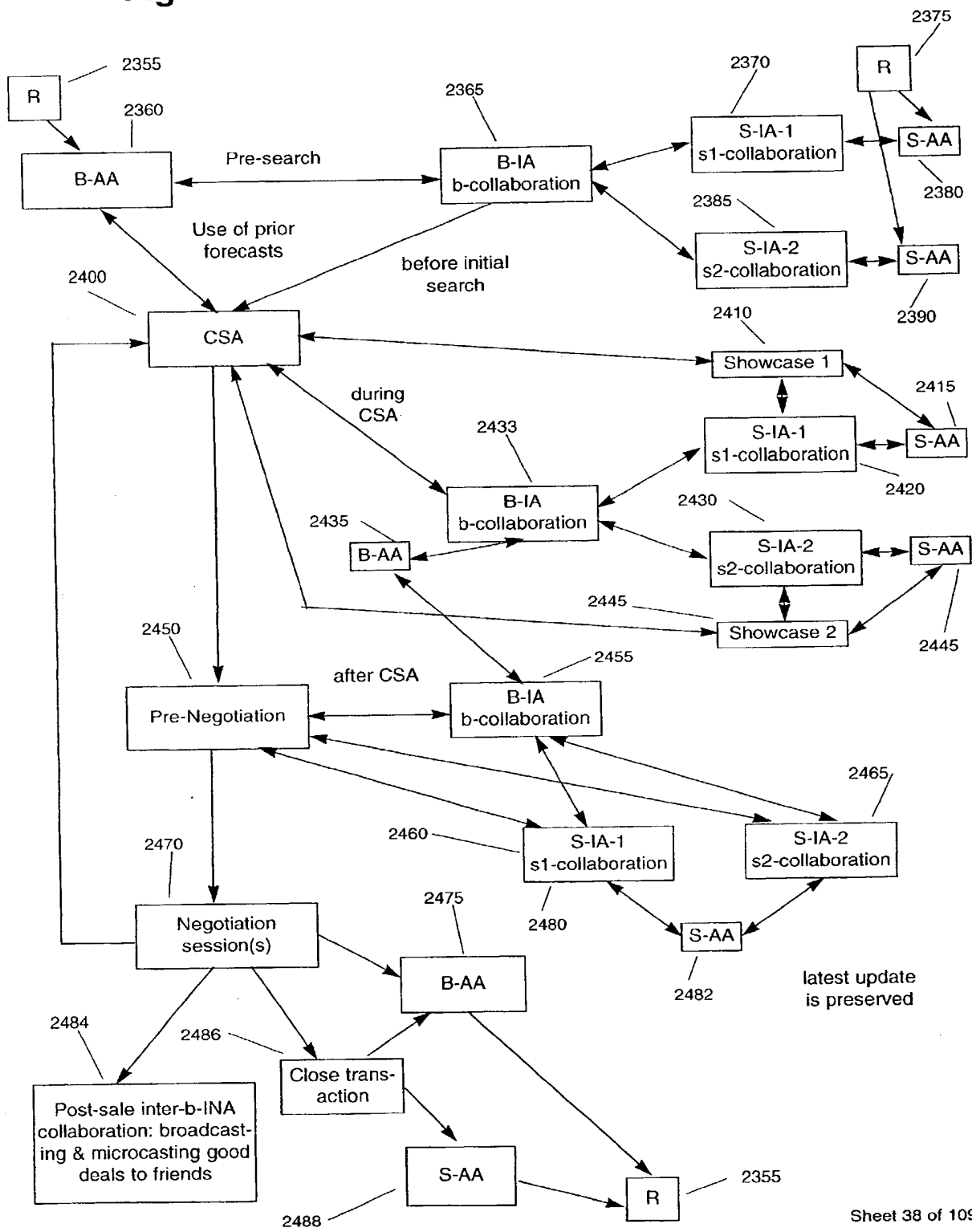
**Fig. 21: RMO Contract Processes in Distributed System**



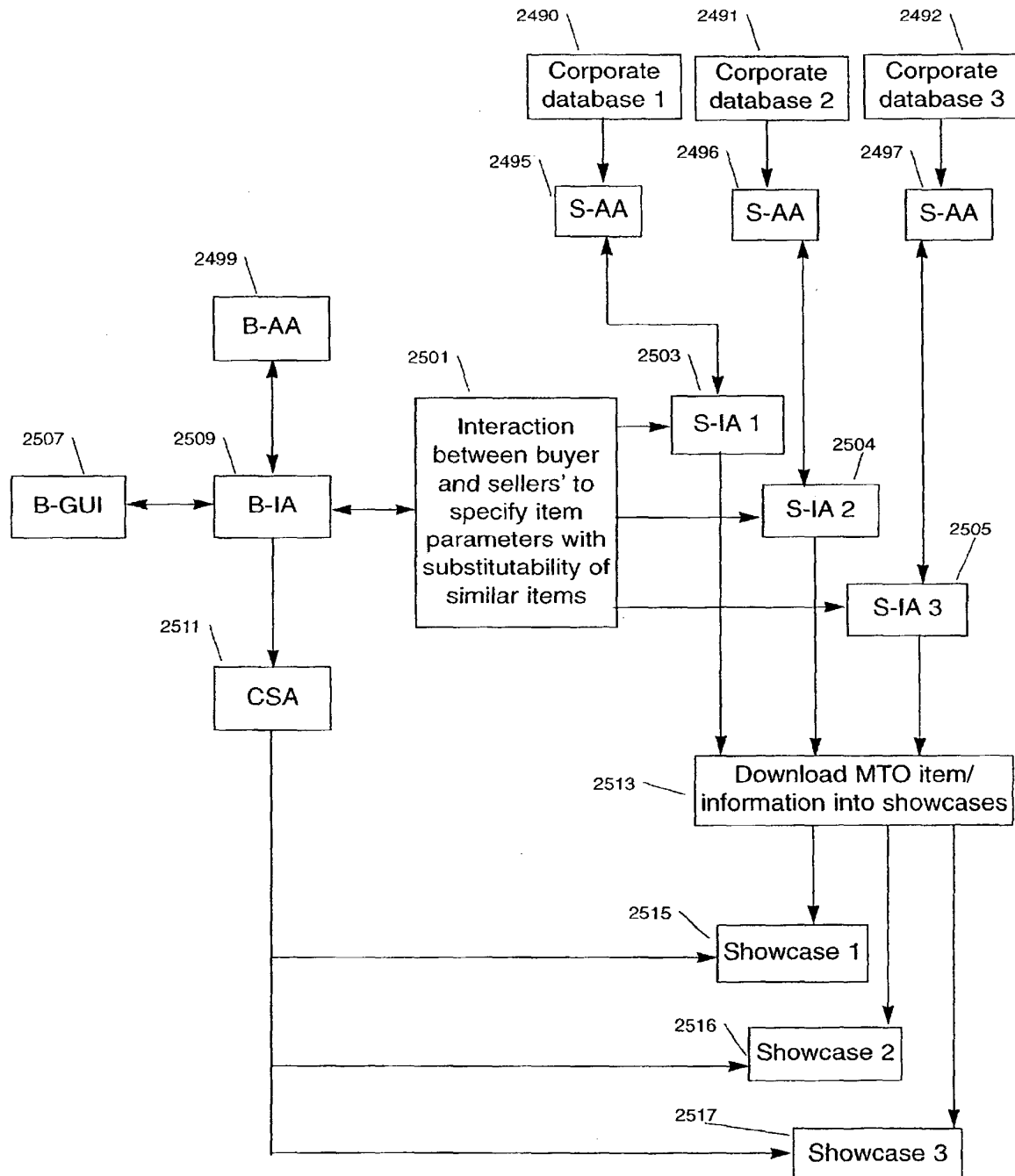
**Fig. 22: Transaction Contingencies**



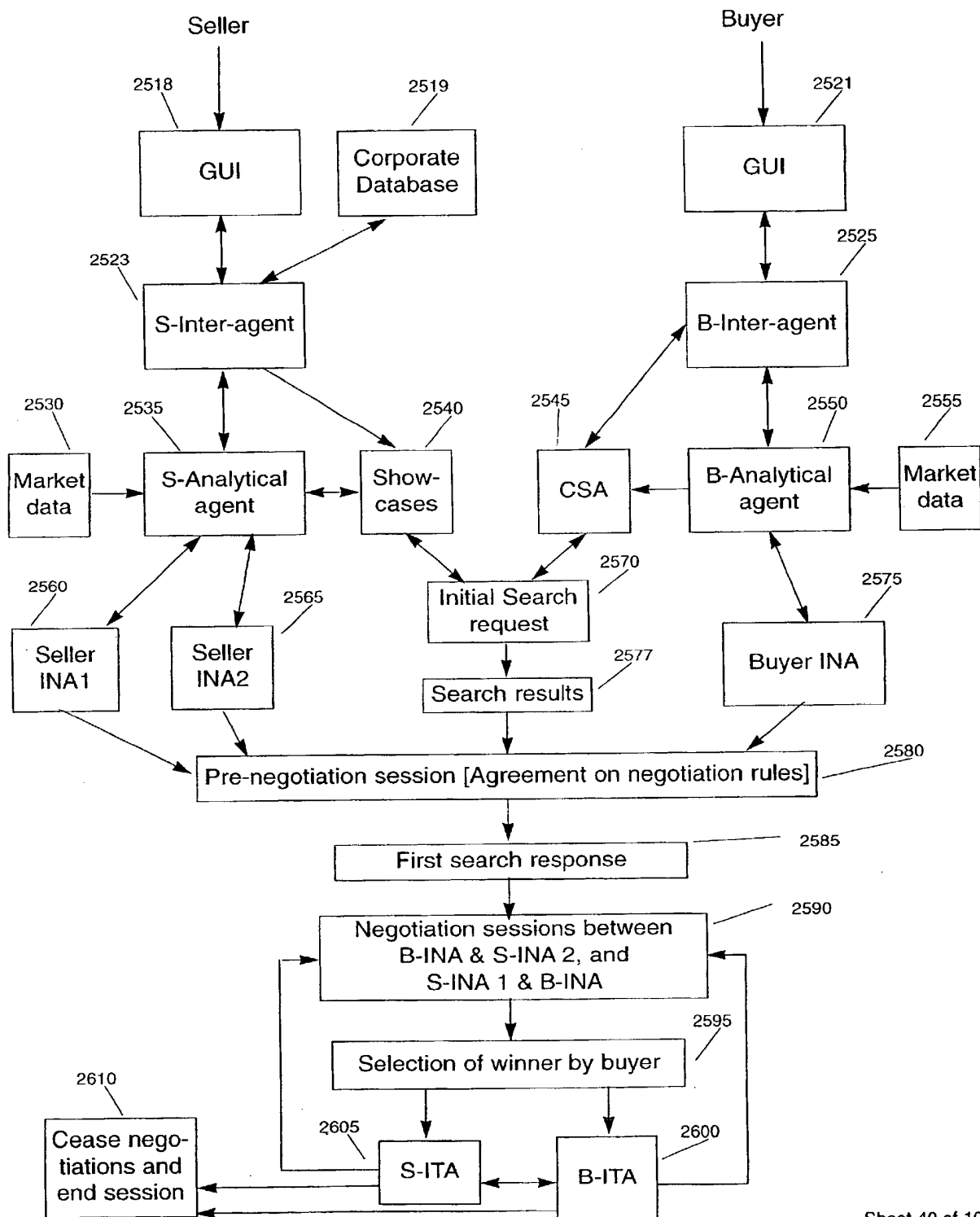
**Fig. 23: Information Collaboration for MTO**



**Fig. 24: Collaboration Process For MTO Customization**

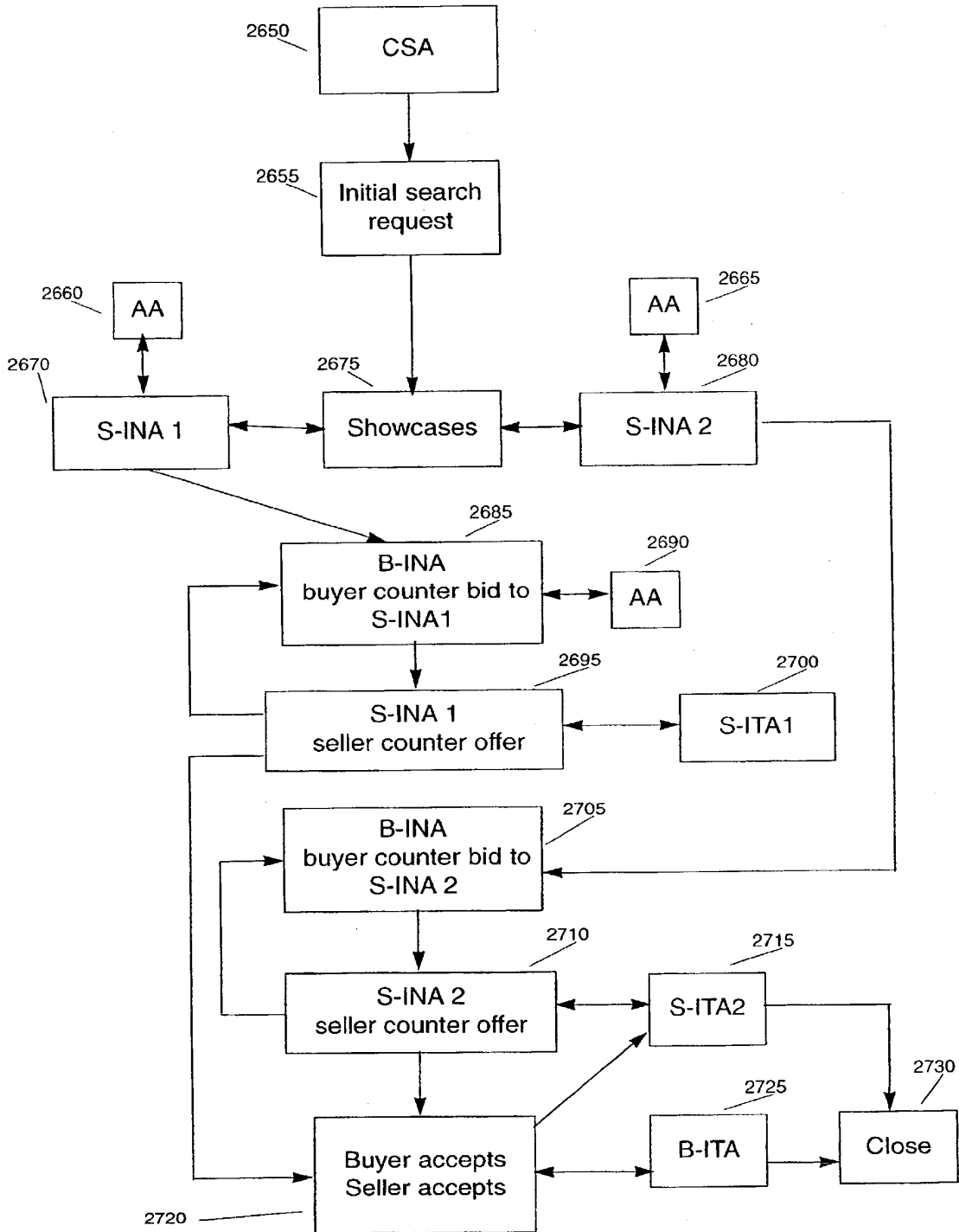


**Fig. 25: INA Interaction (B-INA & S-INA Interactions)**

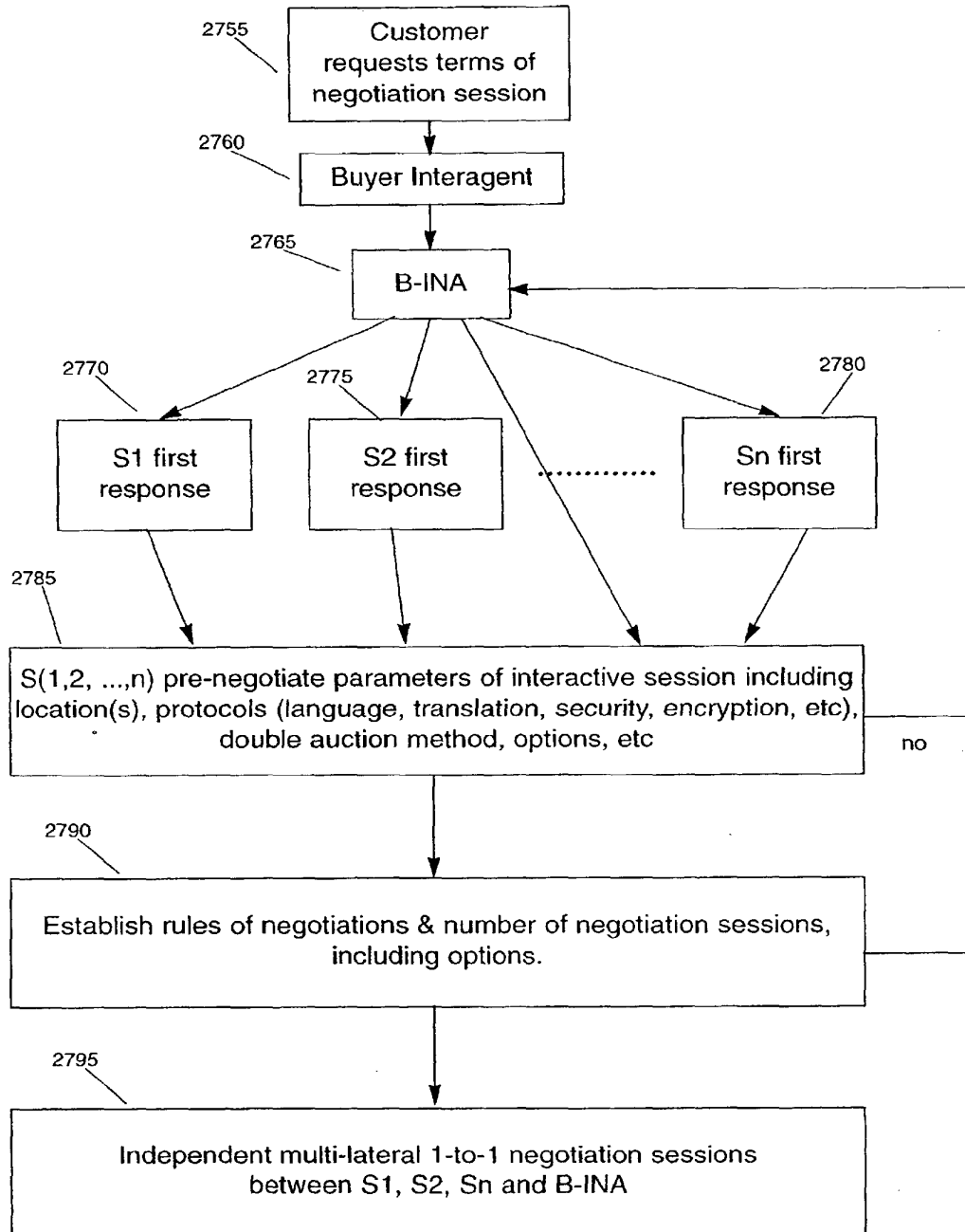




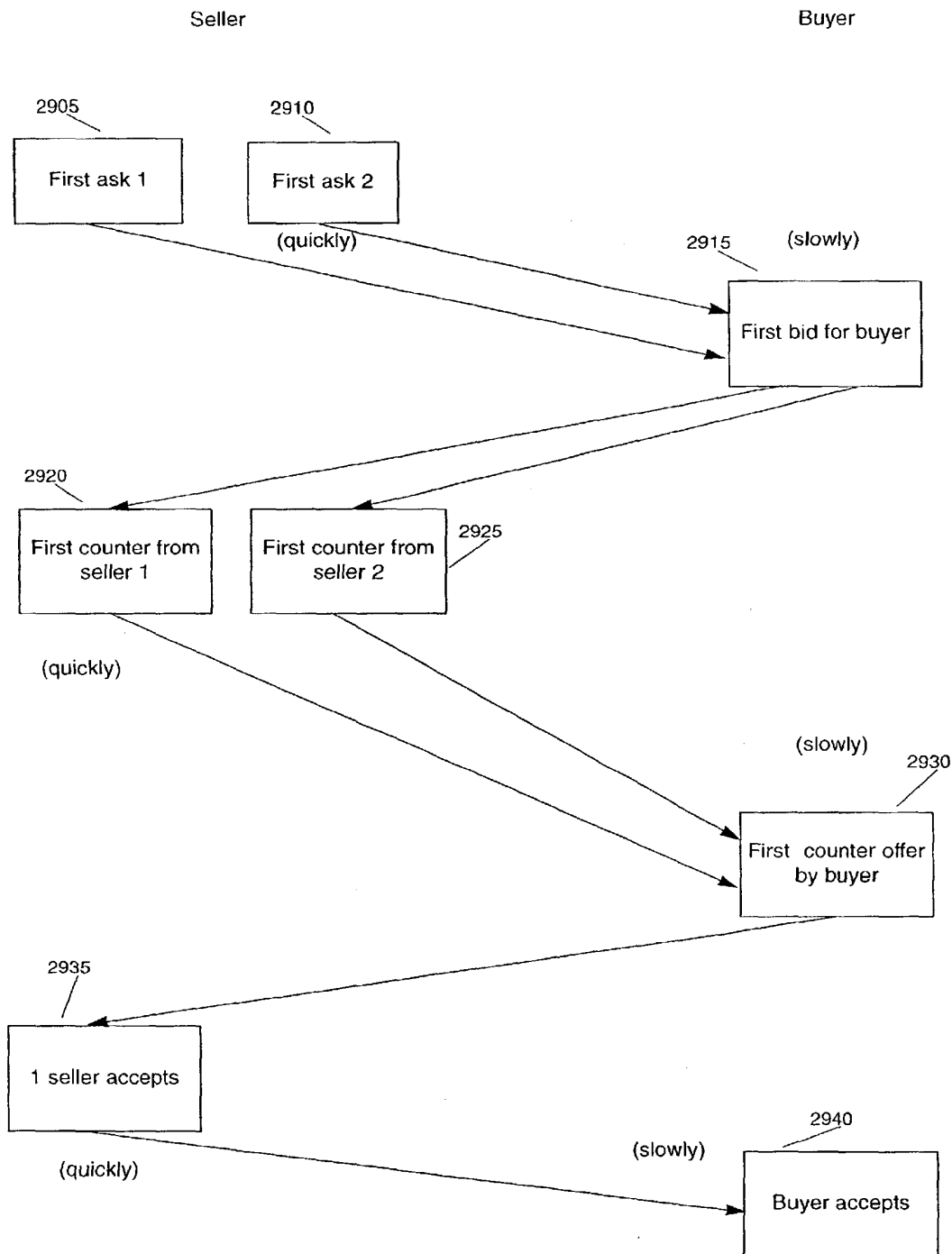
**Fig. 26: INA Interactions - Ricochet Model**



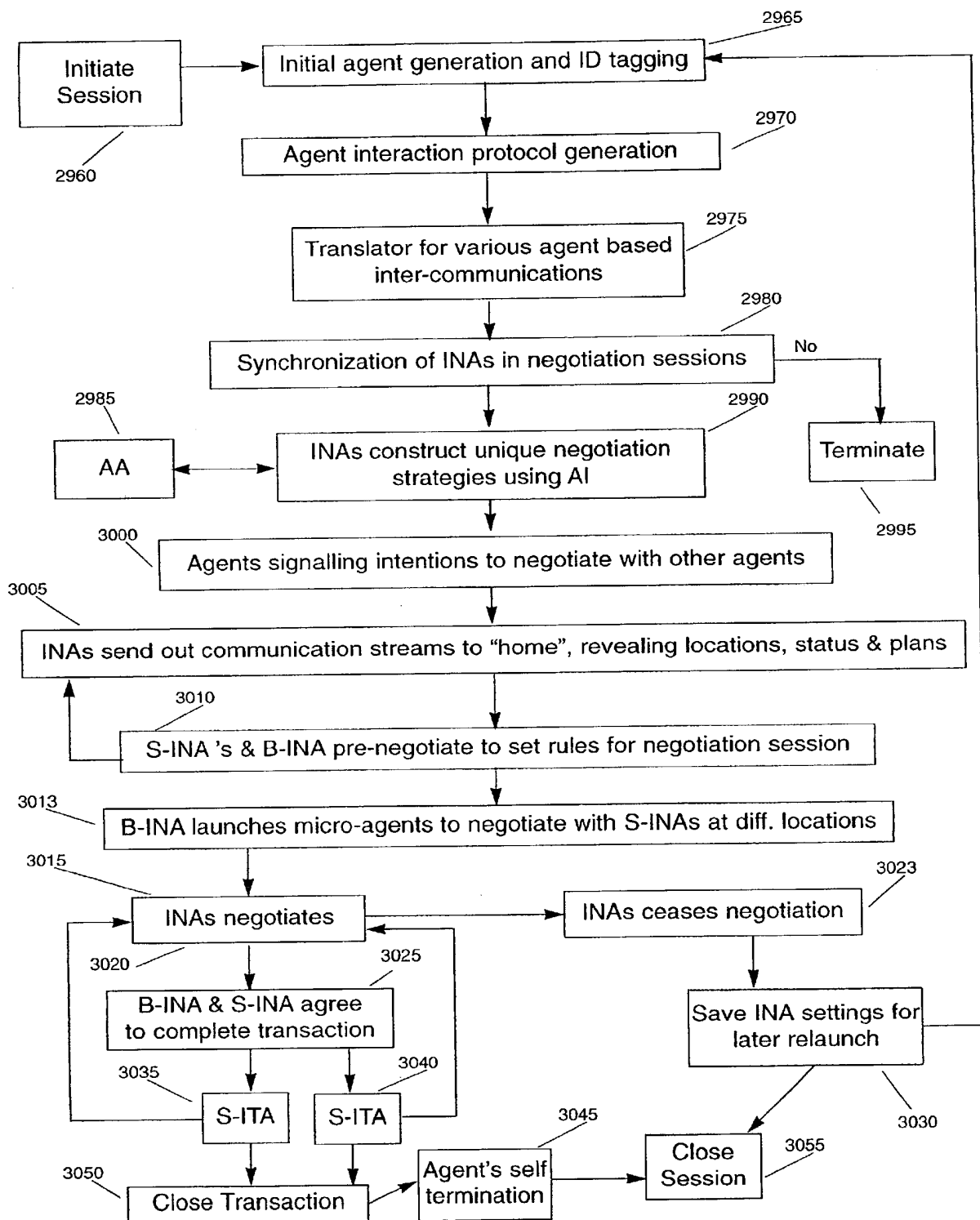
**Fig. 27: Pre-Negotiation**



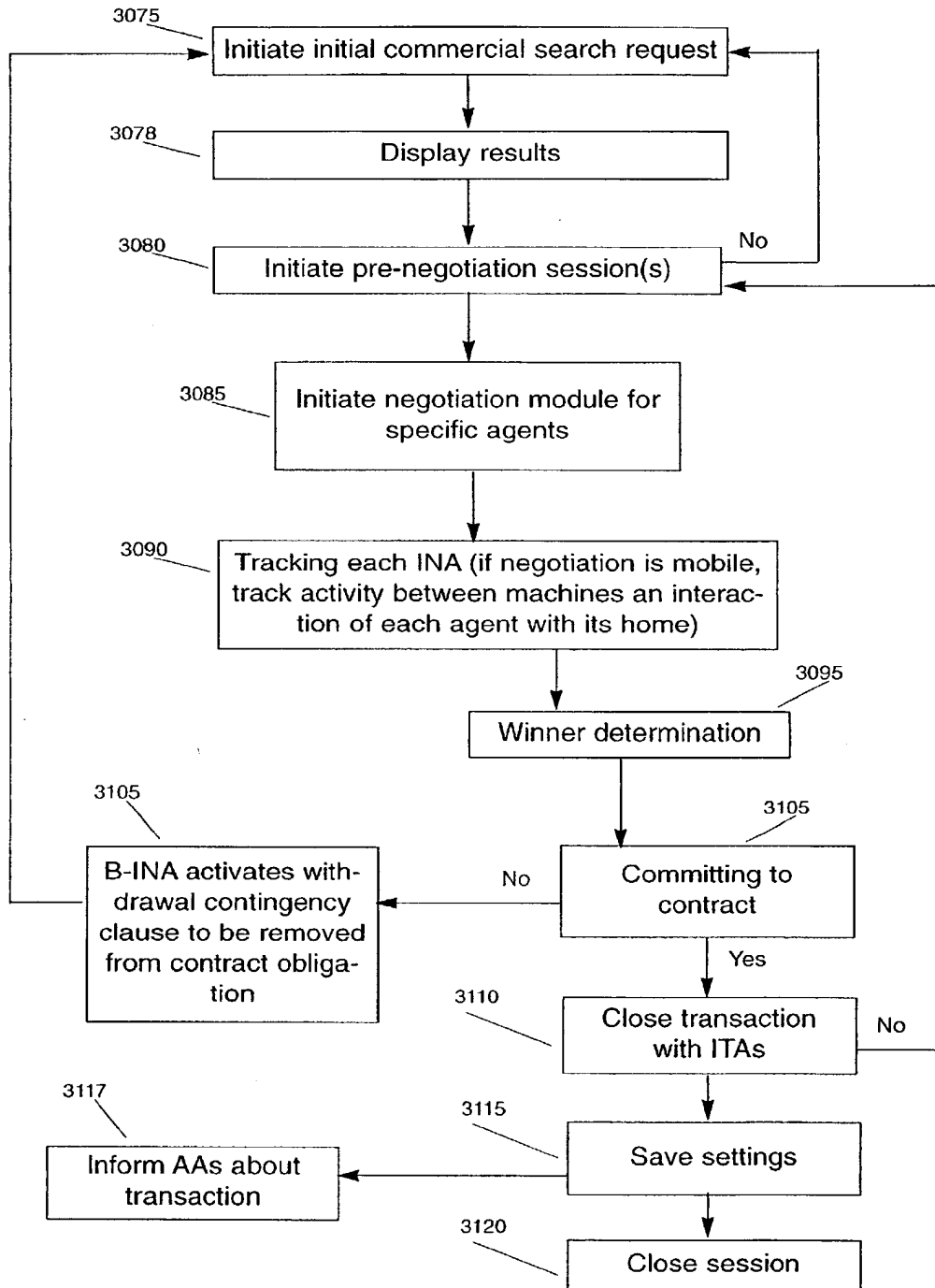
**Fig. 28: Time-Based Negotiation Strategy Concealment**



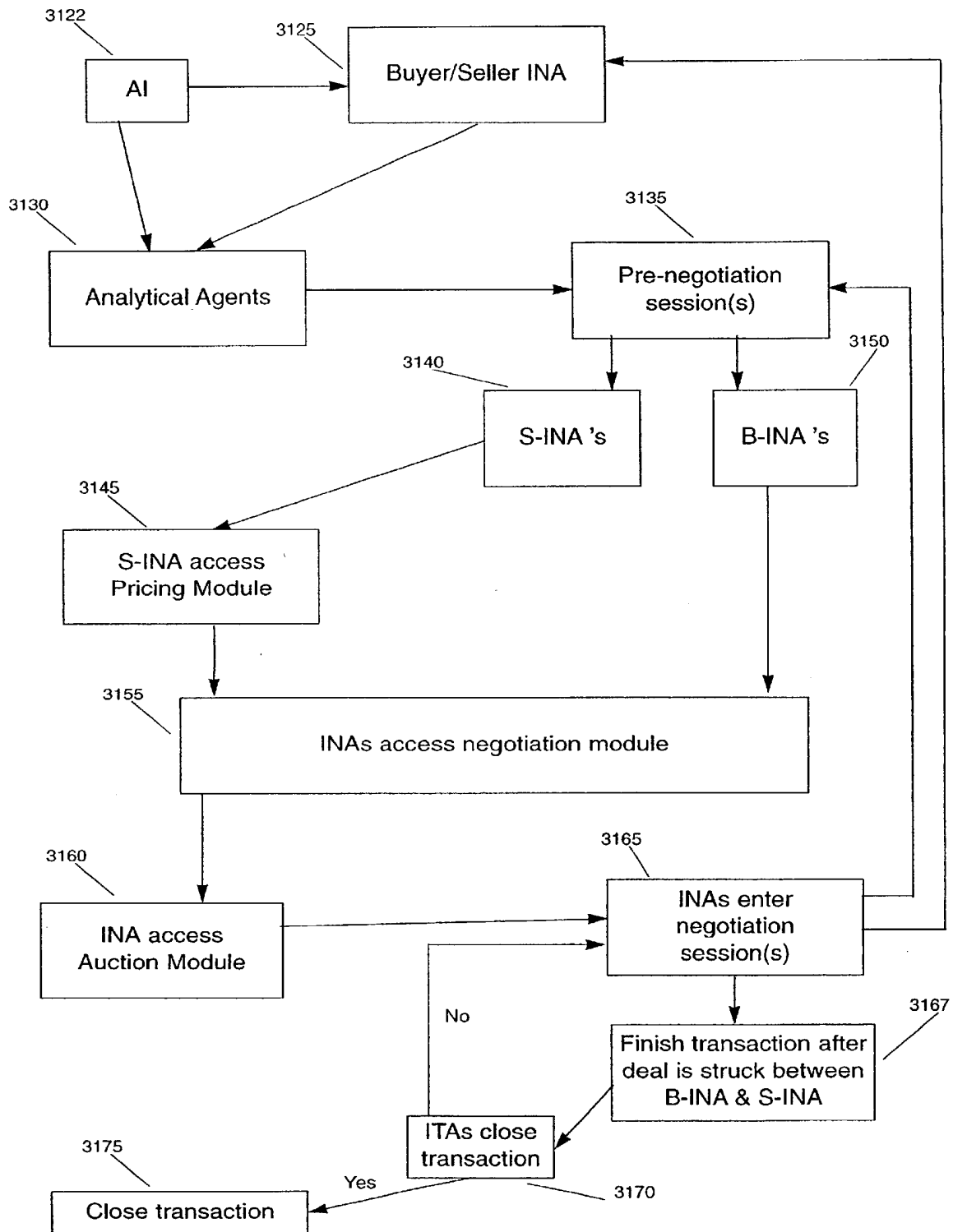
**Fig. 29: INA Logistics**



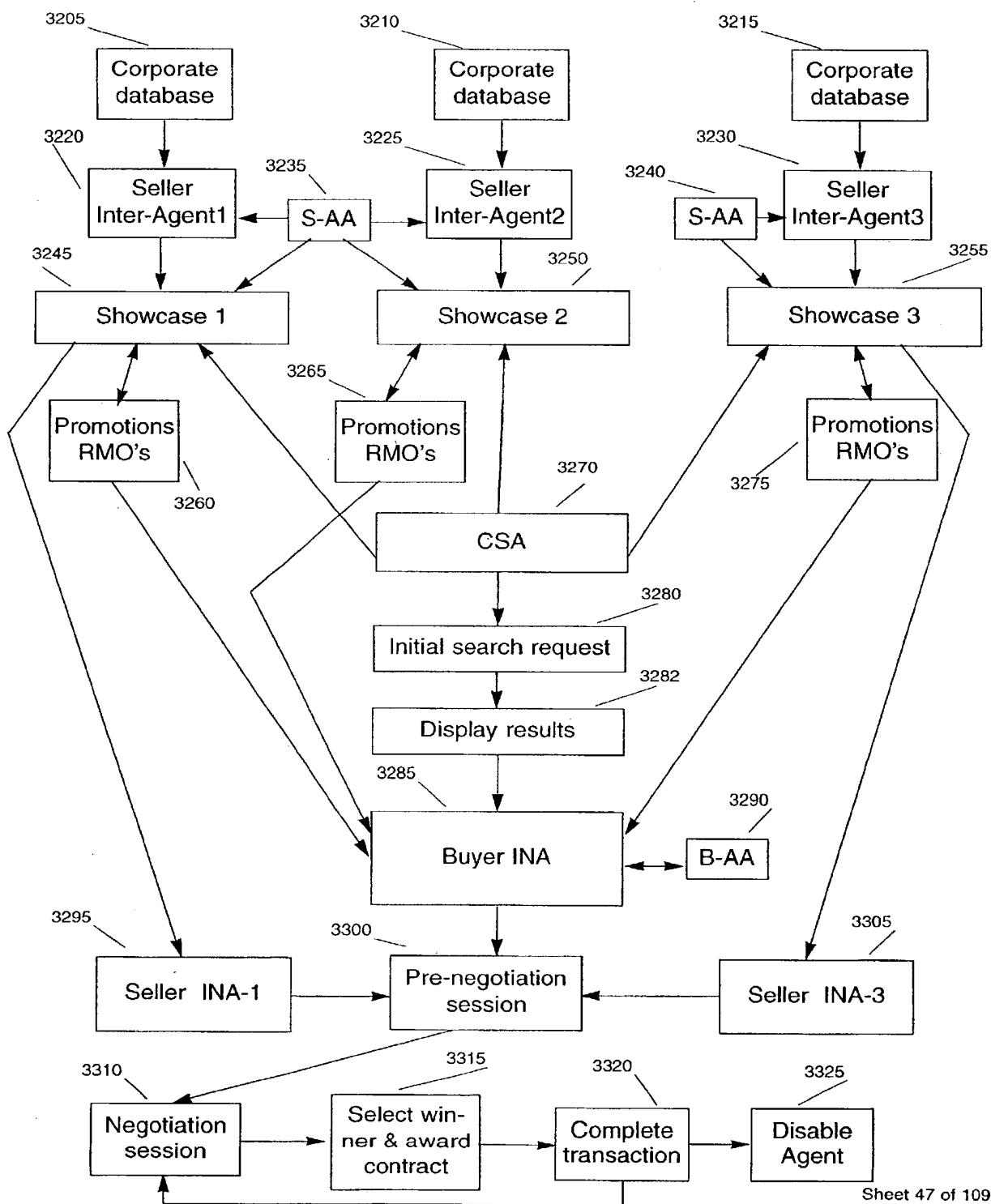
**Fig. 30: INA Interaction Sequence #1**



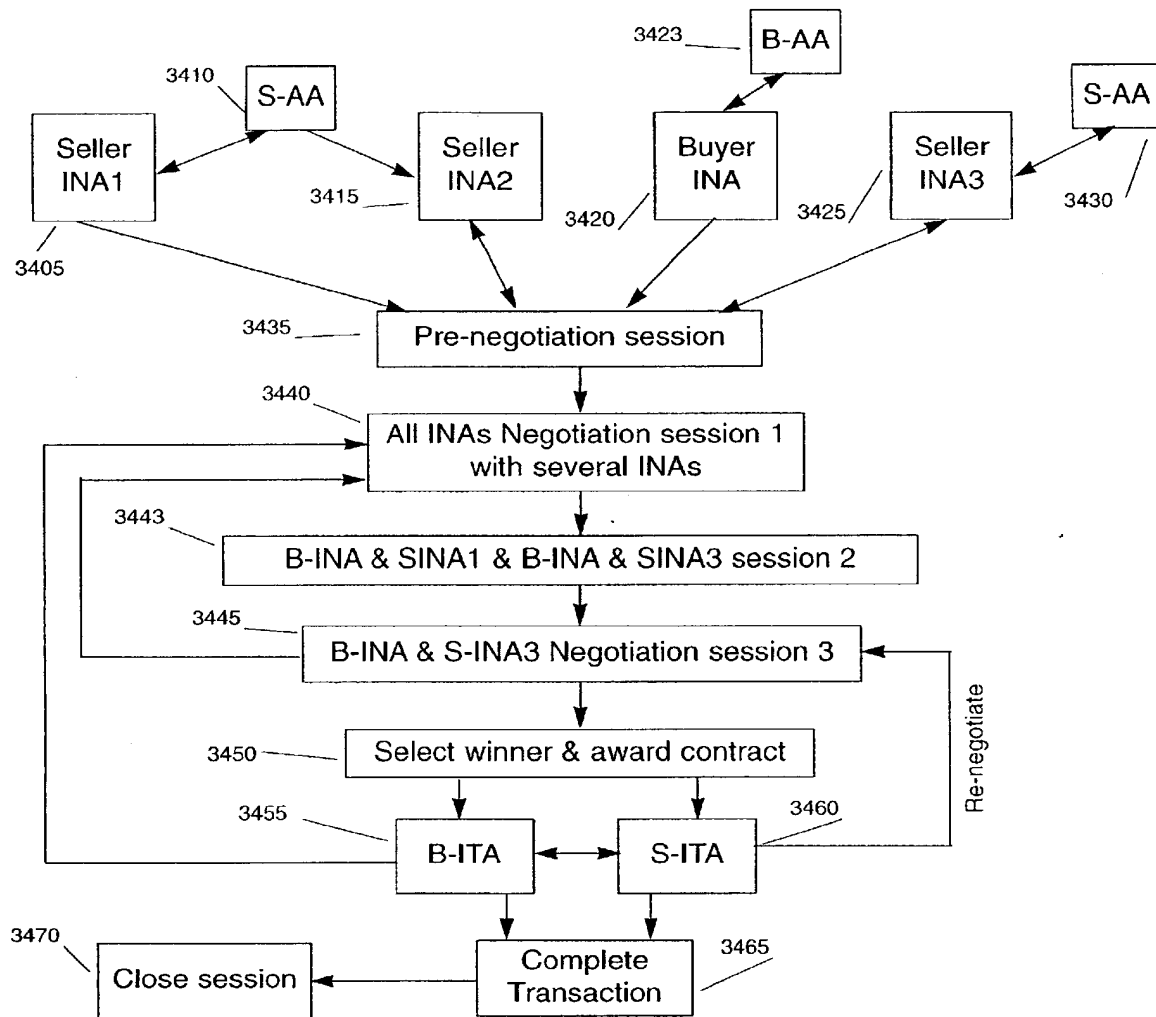
**Fig. 31: INA Interaction Sequence #2**



**Fig. 32: INA Architecture 1** (First part interactions)

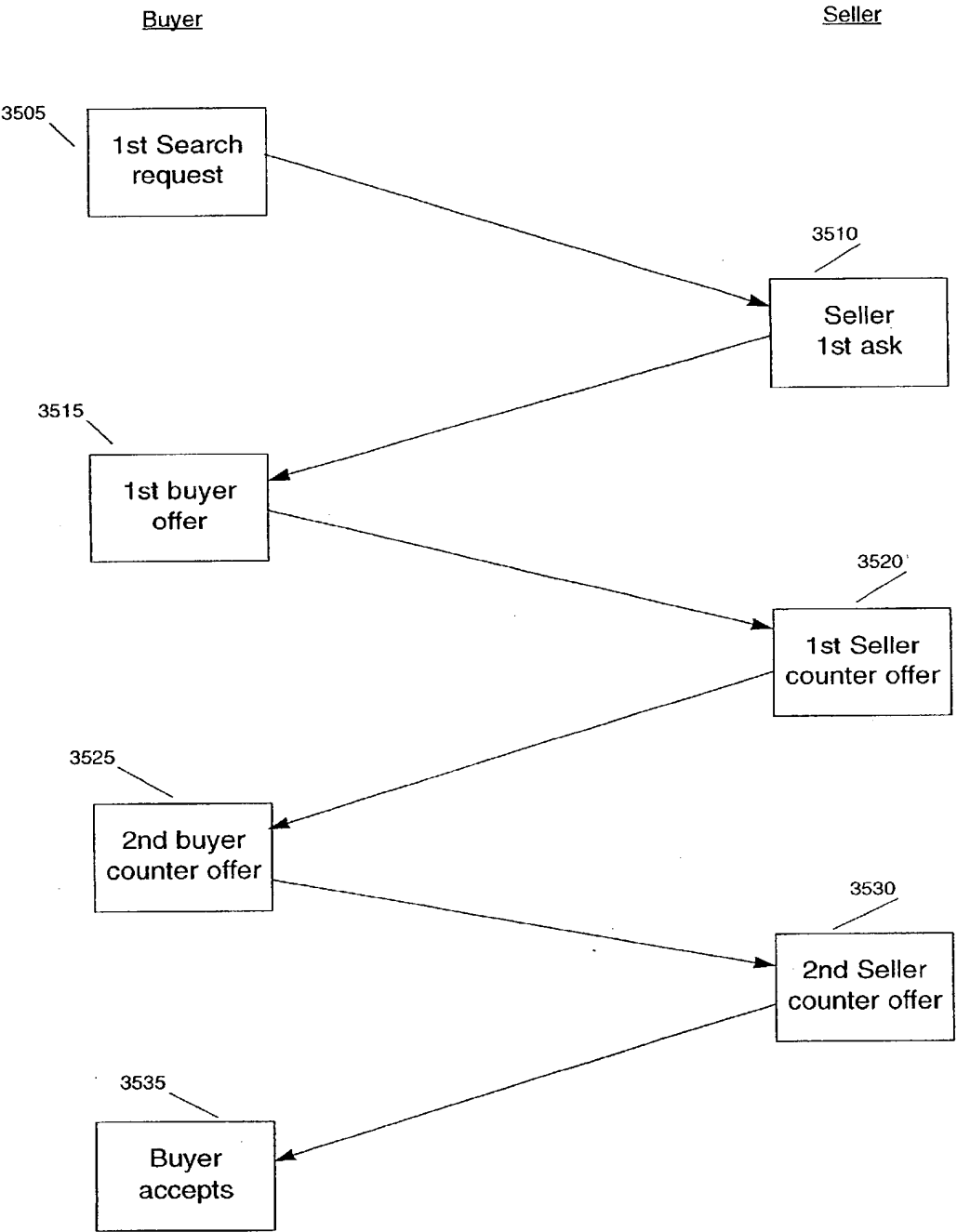


**Fig. 33: INA Architecture 2 (Negotiation interactions)**

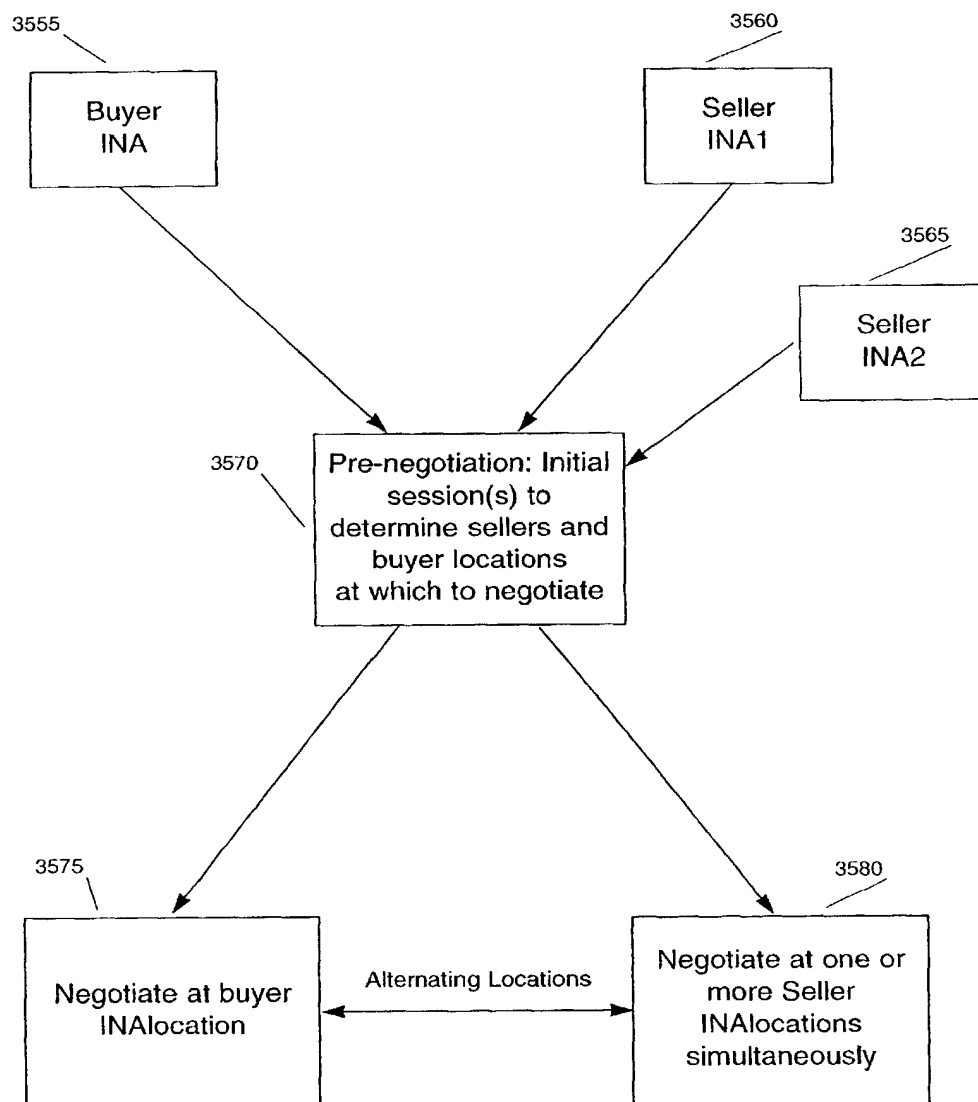




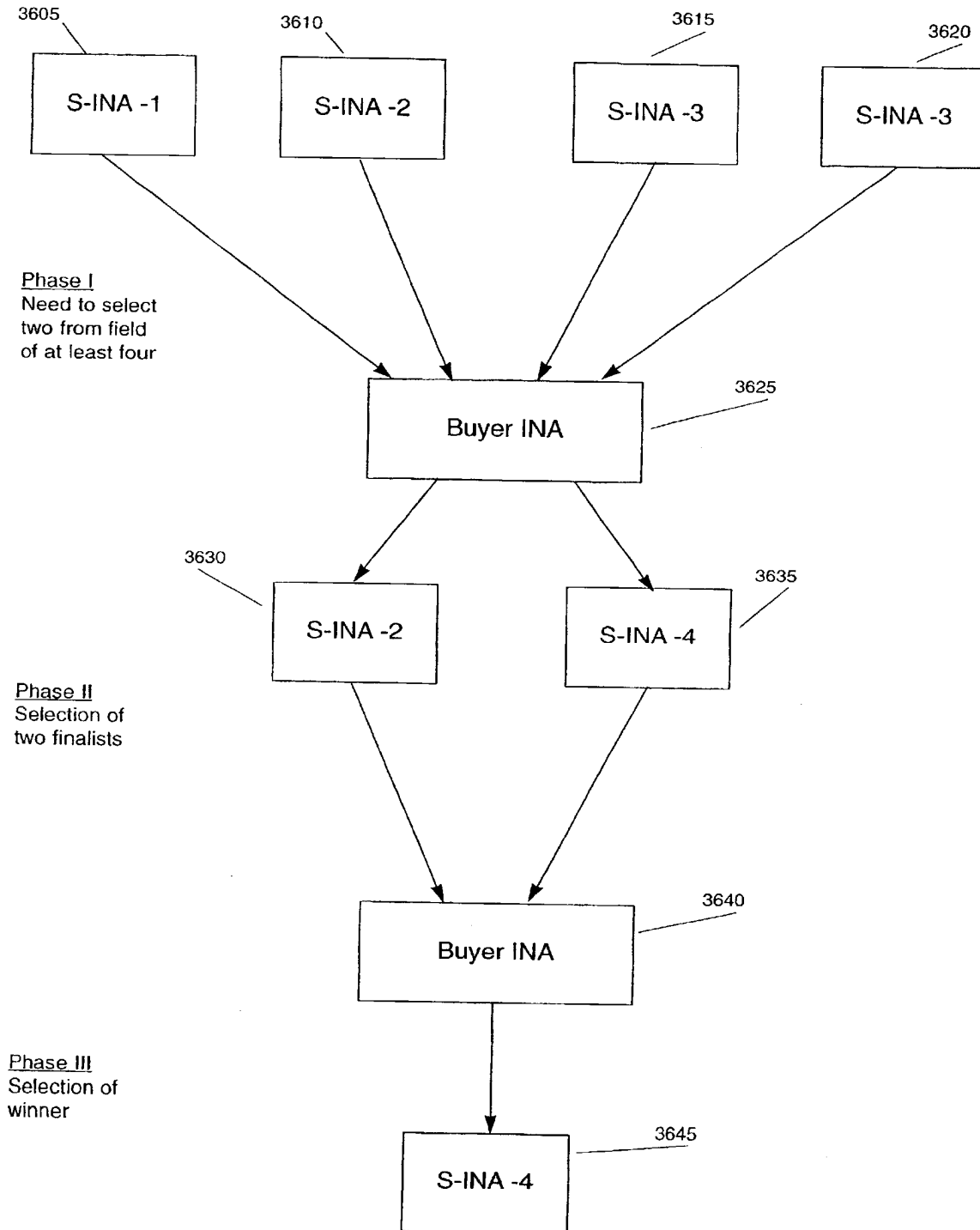
**Fig. 34: INANegotiation Time Based Sequences**



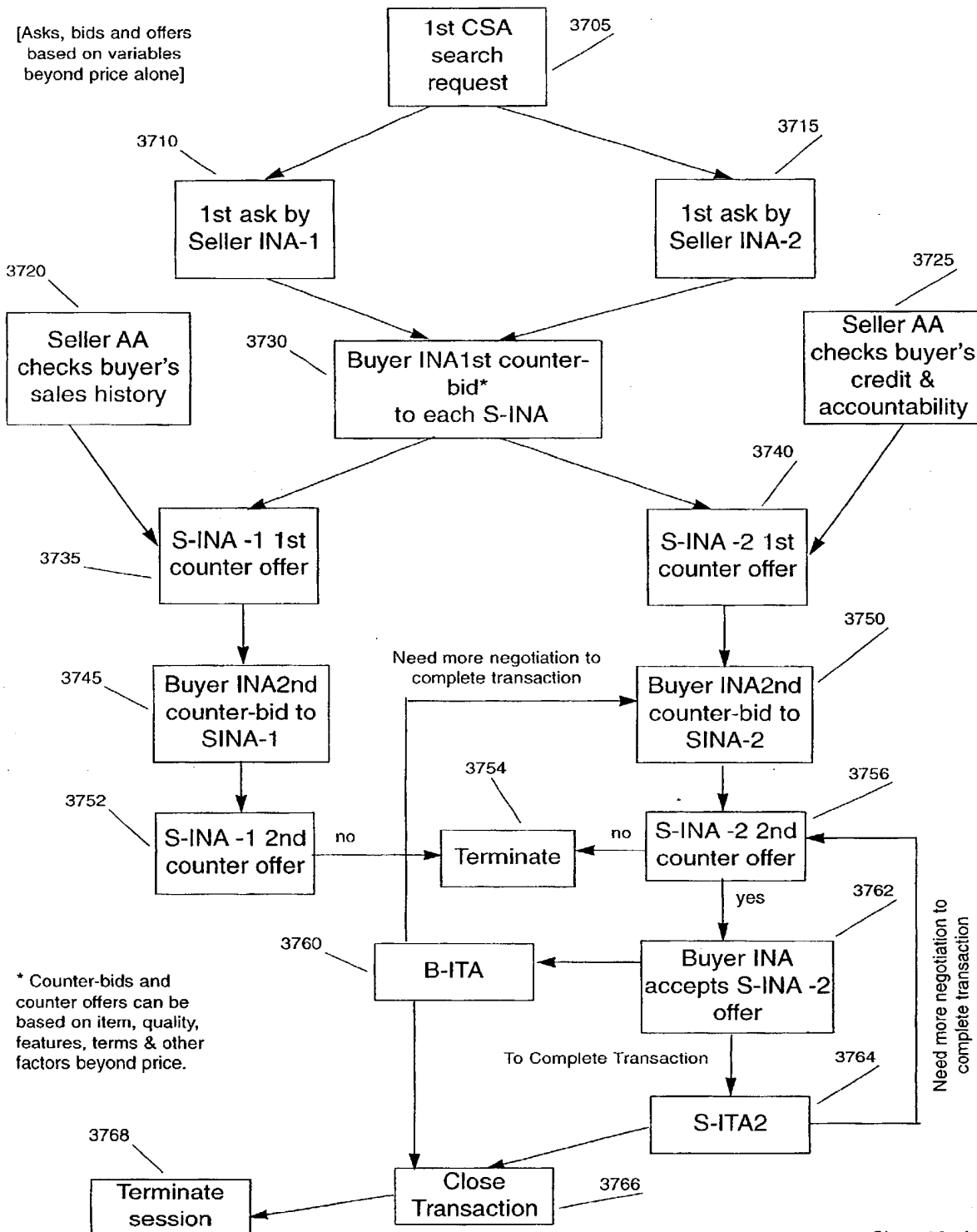
**Fig. 35: Initial INA Mobile Location Protocol Settlement**



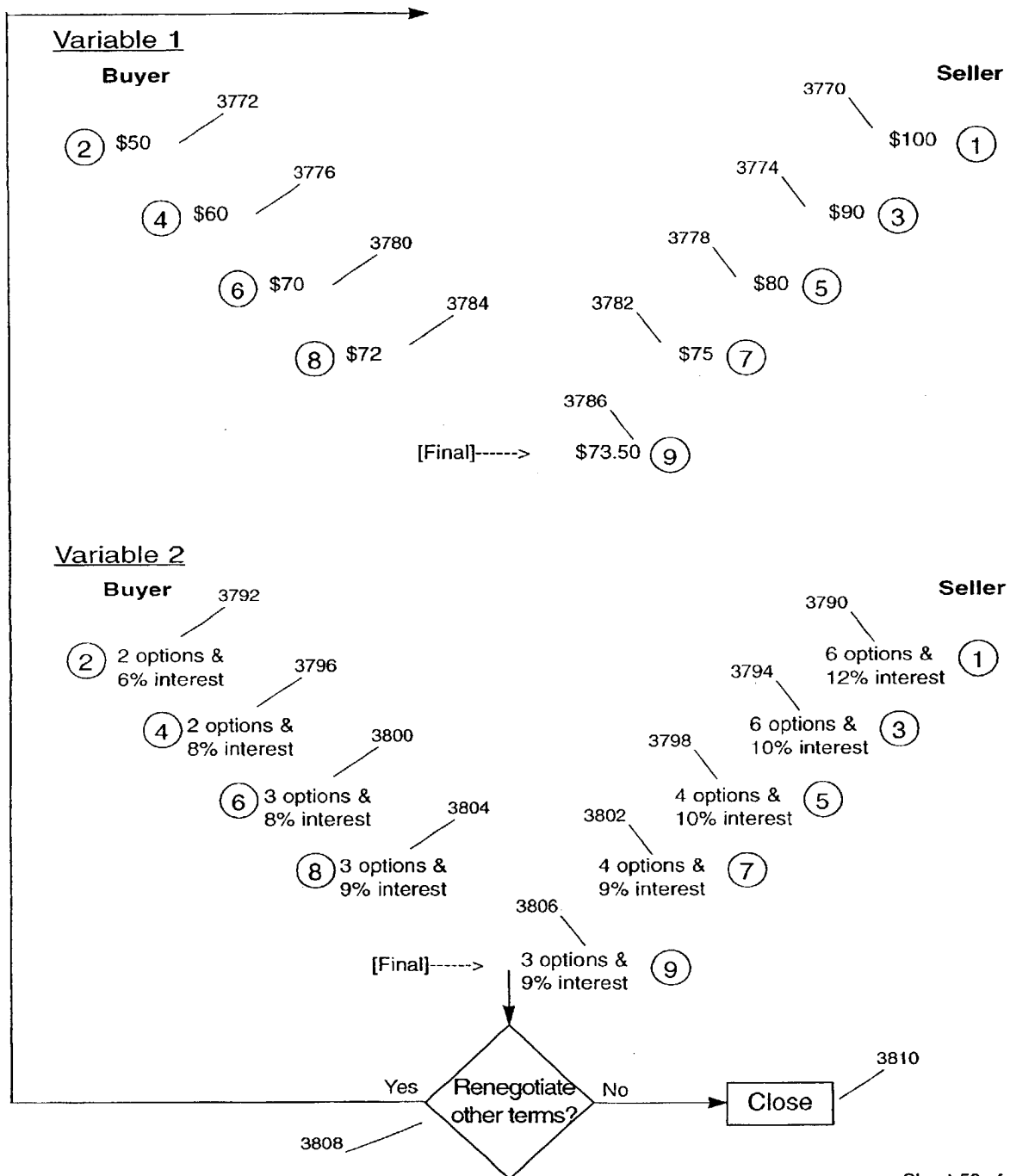
**Fig. 36: Tournament Configuration of  
INA Winner Determination**



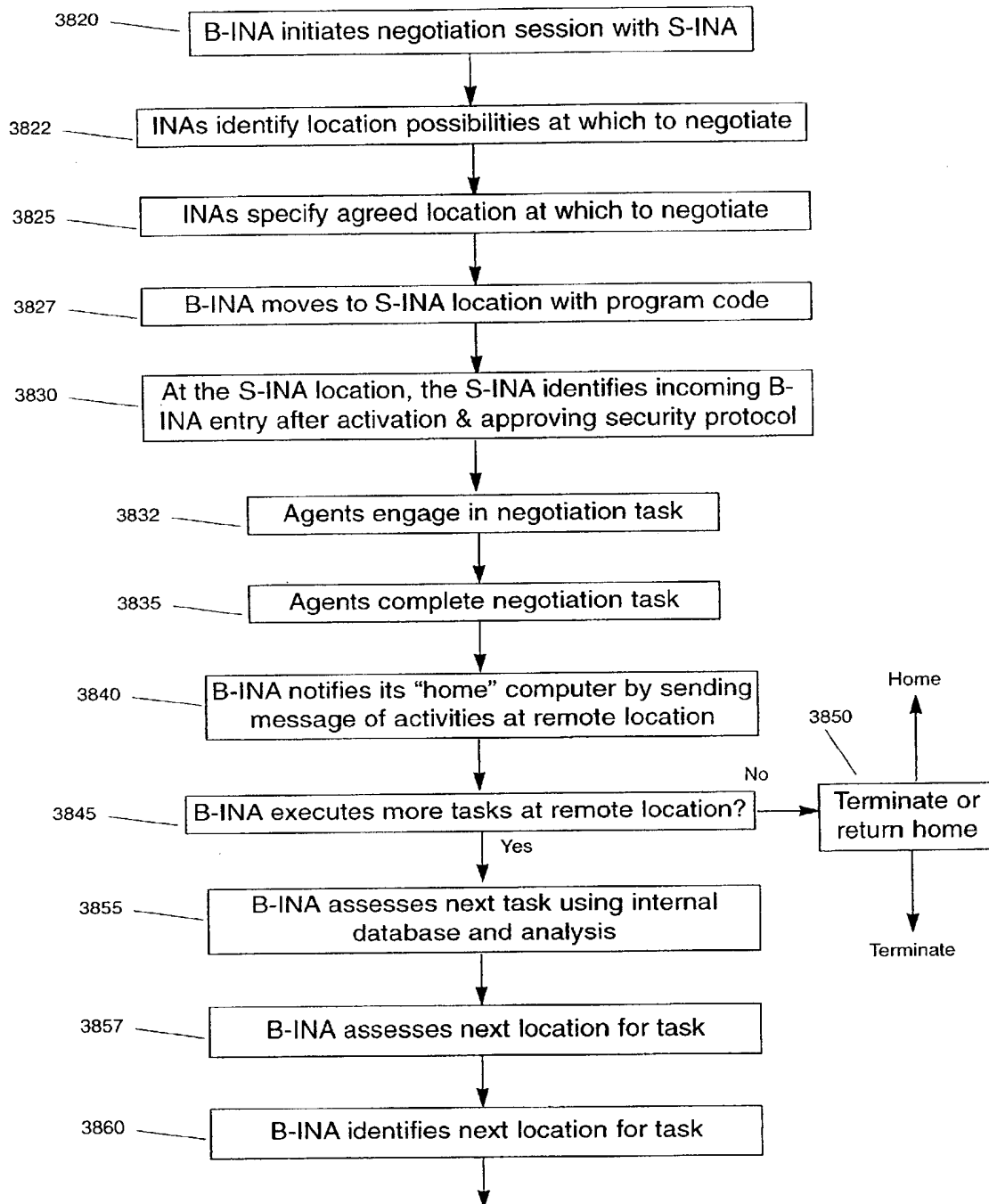
# Fig. 37: Multivariate Negotiation



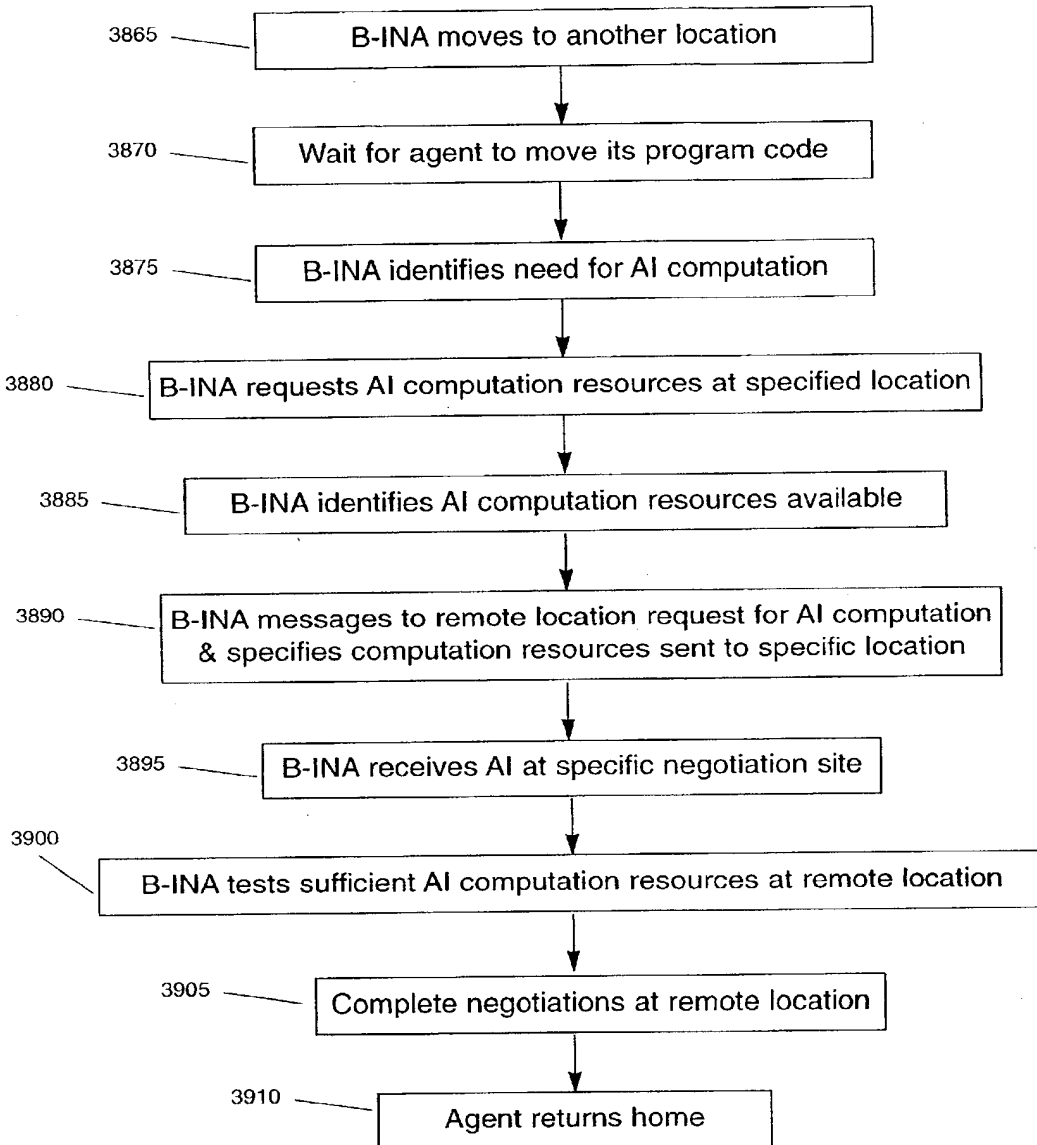
**Fig. 38: Demand-Initiated Automated Negotiation Sequence Compromise Process Within Pre-established Parameters between One Buyer & One Seller**



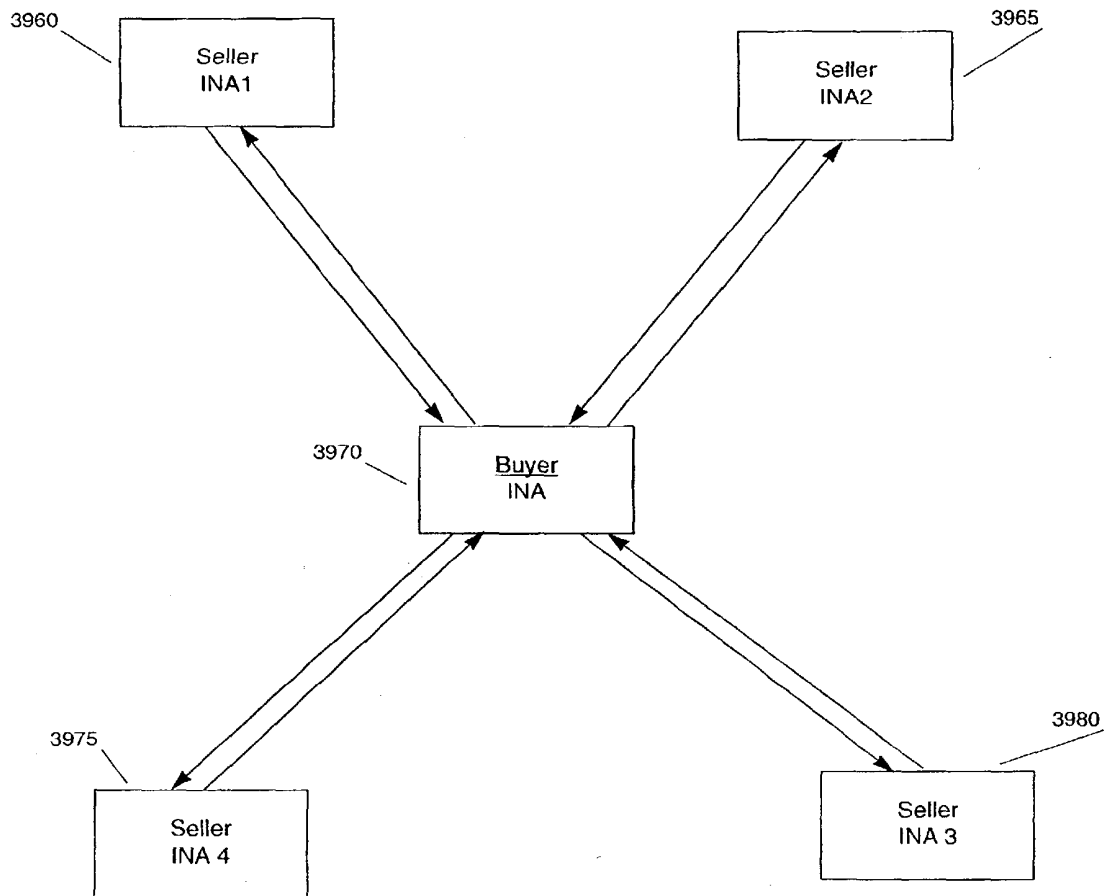
**Fig. 39A: Negotiation in a Distributed System with Mobility**



**Fig. 39B: Negotiation in a Distributed System with Mobility  
(Continued)**



**Fig. 40: Multi-lateral Distributed Competition  
(Competitive Double Shout Negotiation)**





**Fig. 41: Negotiation Module: Negotiation Method Schema**

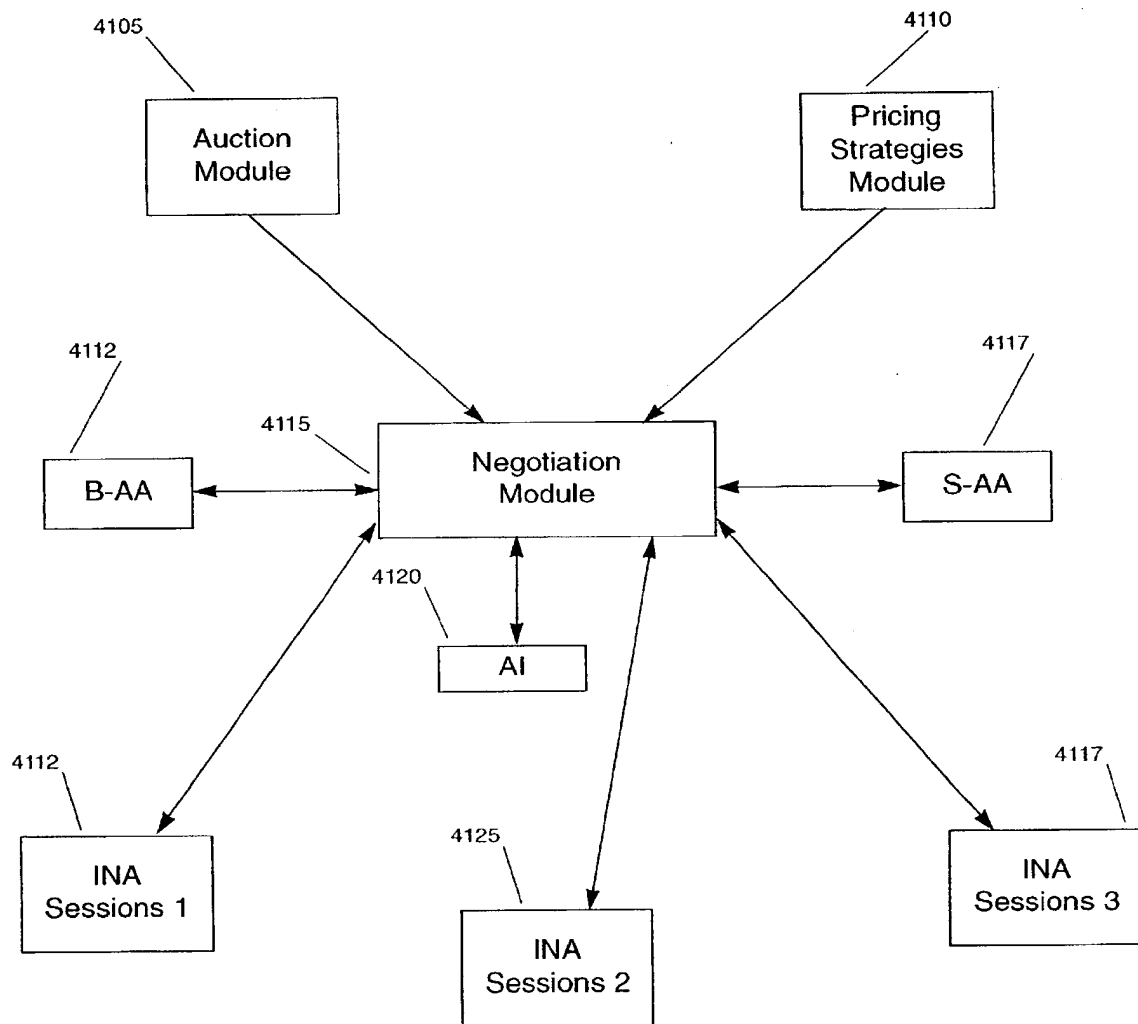
**1 to 1 Interactive Negotiations**

<b><u>Kinds Of Goals</u></b>	<b><u>Cooperative Goals</u> (Zero-Sum Game)</b>	<b><u>Competitive Goals</u> (Zero-Sum Game)</b>
Short Term goal (price - maximization)	1) Exchange-based approach: Trade-off of terms/variables between parties a) matching of interests: ascertain mutual interest with overlapping sets...	1) dialectical approach: give & take of opponents until resolution a) [position description & justification] explanation based: each position advances and develops b) [Interrogation] argumentation: critique of opponent's position*
-vs-	b) prioritizations of preferences: hierarchy of similar priorities	c) [Ascertain mutual self-interest] Assessing overlapping interests d) Selecting common sets
Long-term goal (relationship management)	2) Problem-solving approach: parties seek a common solution a) assessing common interests among different positions b) compromise of positions to a common set shared by parties	*Anticipate opponent's strategy
<b><u>Constraining Factors</u></b>	<b><u>Buyer-Initiated</u></b>	<b><u>Non-Zero-Sum Game</u></b>
1) Time constrained: multi-sessions as instrumental changes	[Negotiation as adjustment of seller parameters] a) buyer query as initiation b) priority of best and then second best, and then third best, etc...	1) deterrence approach: behaving so that competitors do not get without higher cost a) bidding aggressively and/or deceptively and then withdrawing
2) Information constrained: less than optimum information		
3) Choice Constrained: Limiting of options		
<b><u>Terms</u></b>	<b><u>Multiple Parallel Interactive Negotiations</u></b>	<b><u>Seller initiated</u></b>
1) Item terms 2) Transaction terms	<b><u>One to several</u></b> a) Stopping negotiation when one winner is selected	[Negotiation as disagreement with initial seller promotions] a) promotions or 1st seller bid (result of search query) as 1st point of departure
		<b><u>Several to several</u></b> Single Item: Stopping negotiation when one buyer & 1 seller is selected Multiple items: a) Stopping negotiation when mutual agreement of multiple parties

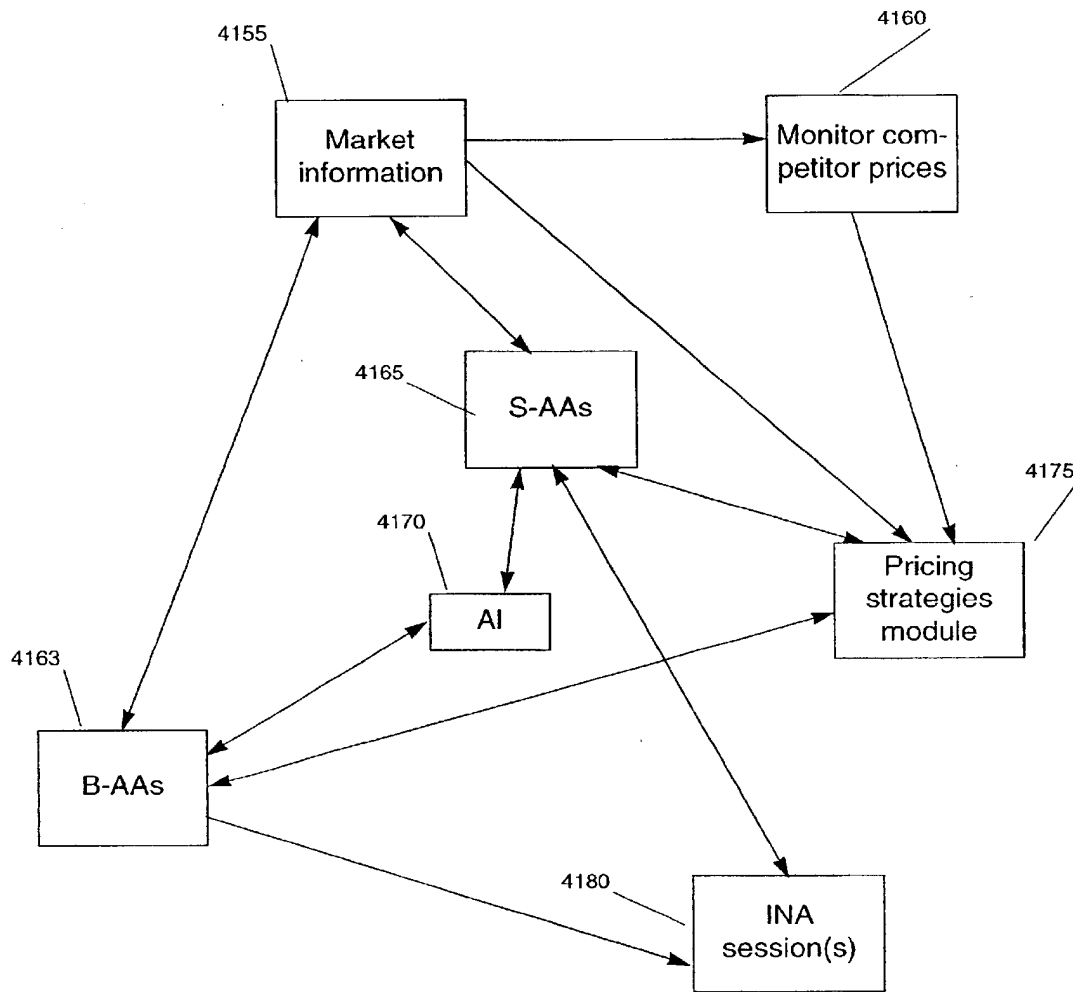
**Fig. 42: INA Auction Module-Auction Types**

Auction Types	
English (Increasing)	Dutch (Decreasing)
Vickrey (second highest bid)	"combinatorial" multiple-item auctions (package deals)
Combinations of auction types	Double-shout

**Fig. 43: Negotiation, Pricing & Auction Module Interactions**



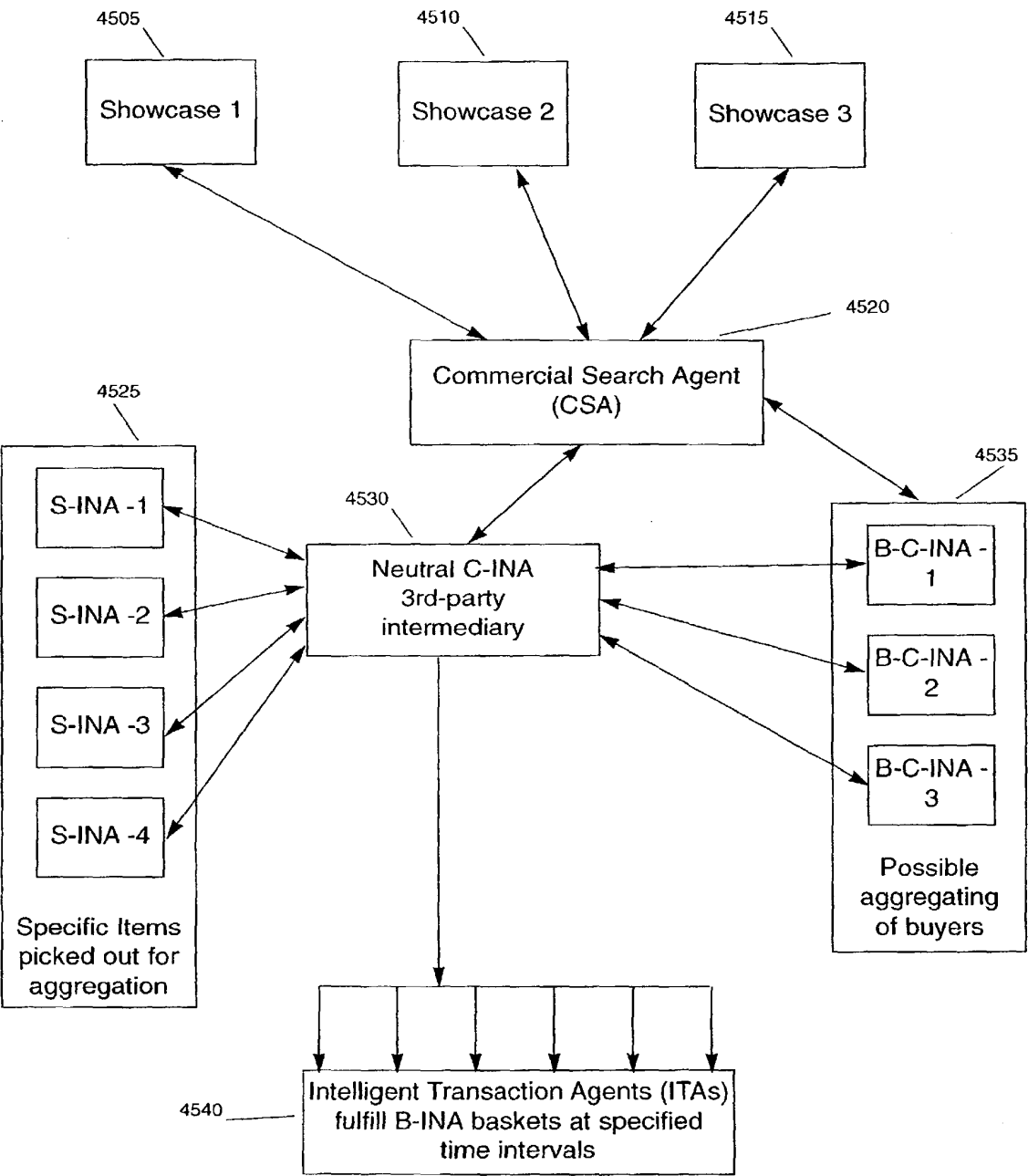
**Fig. 44: Pricing Strategies Module and AA Interactions**



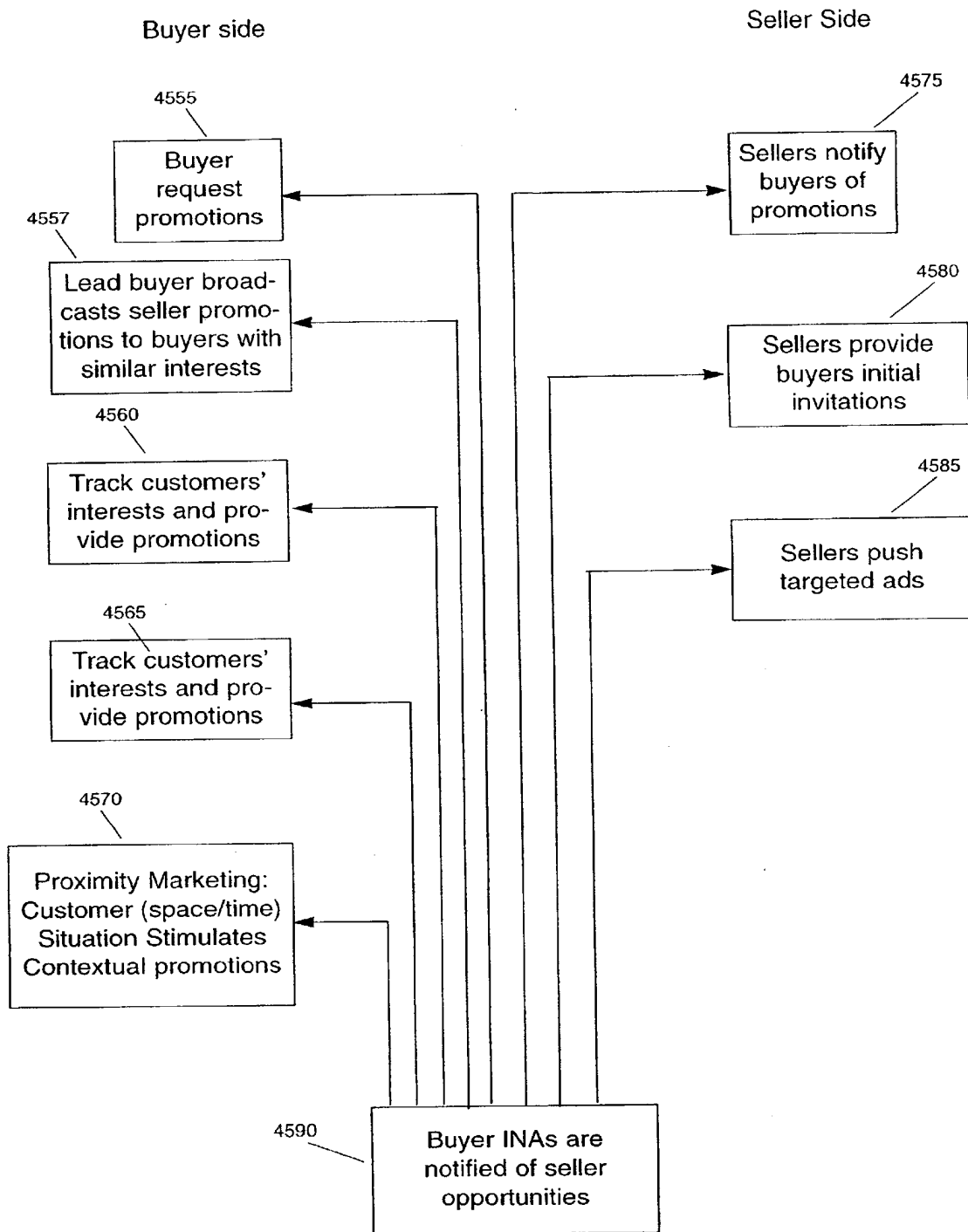
**Fig. 45: Interaction Dynamics of INA “Personalities”**

Yield Management	-Seller surpluses -Buyer shortages		-Seller shortages -Buyer surpluses
INA Stance	Optimistic		Pessimistic
INA Stance	Opportunistic (exploit)	neutral	Conservative (wait)
INA Stance	Aggressive (rush)	neutral	Unaggressive (delay)
Combination of INA Stance	Alternating between various “Attitudes” primarily to disguise INA Stance(s)		

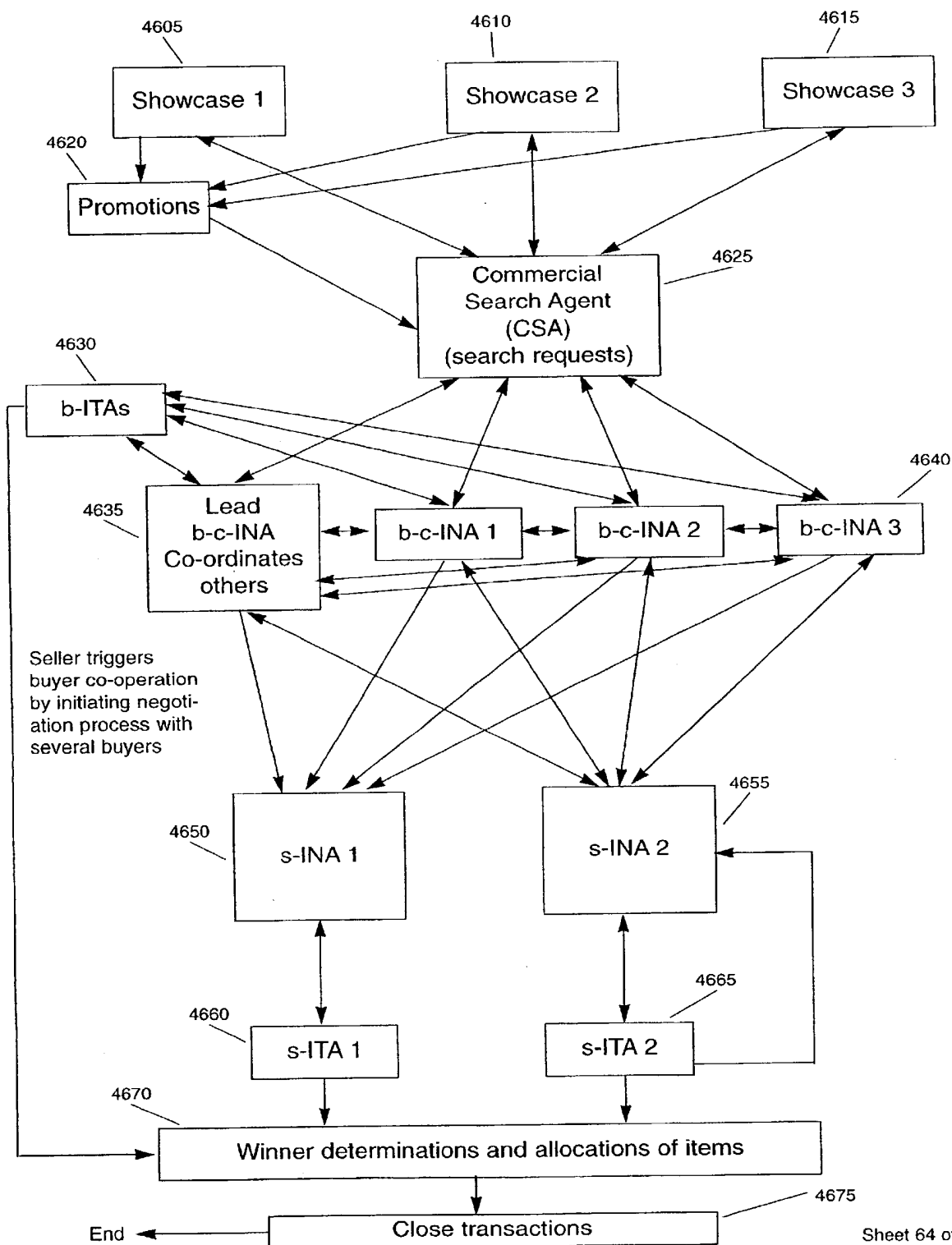
**Fig. 46: Neutral Broker Agency  
C-INA Intermediation & Aggregation Applications**



**Fig. 47: C-INA Transaction Initiation Sources**



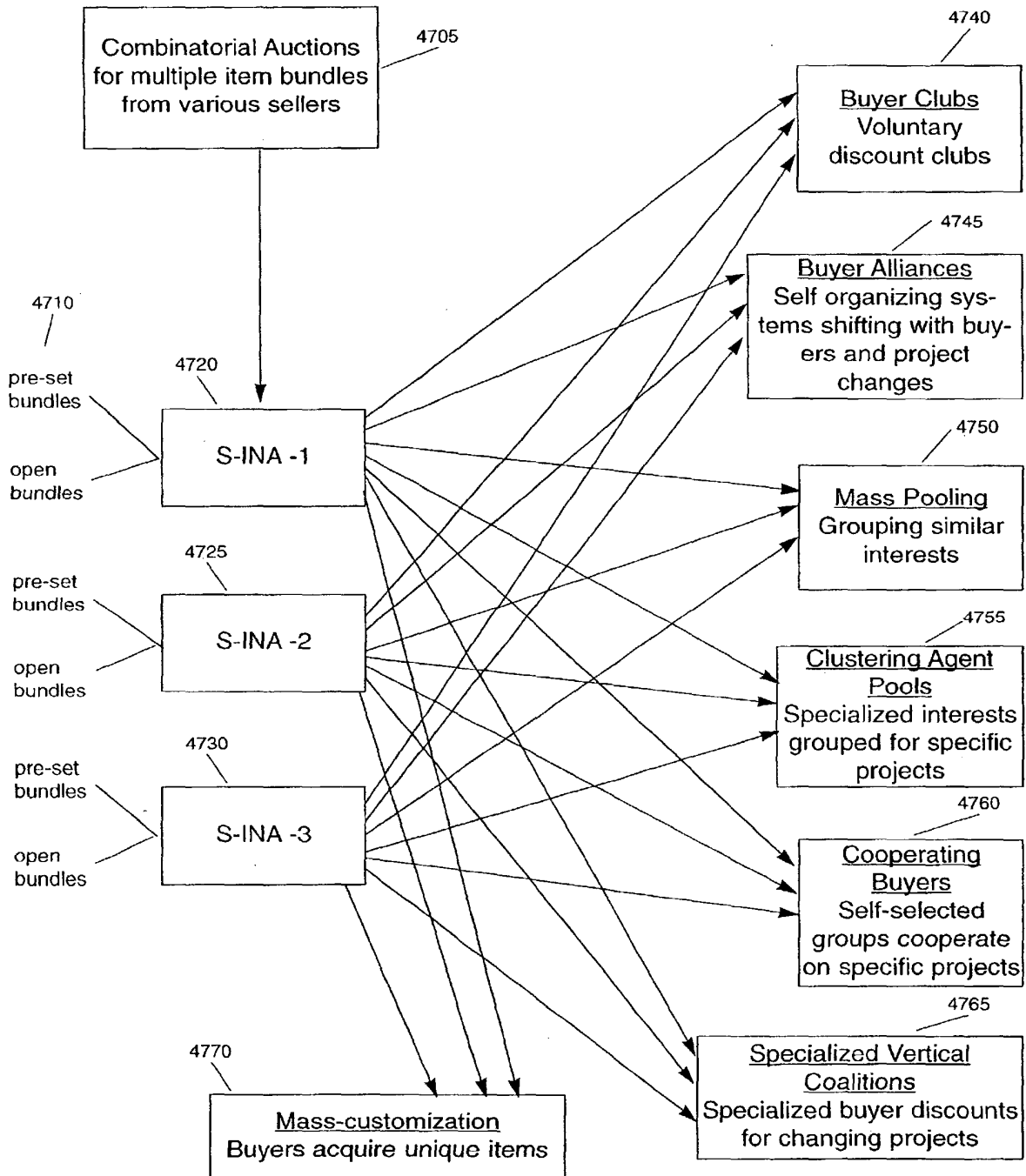
**Fig. 48: B-C-INA Aggregation**



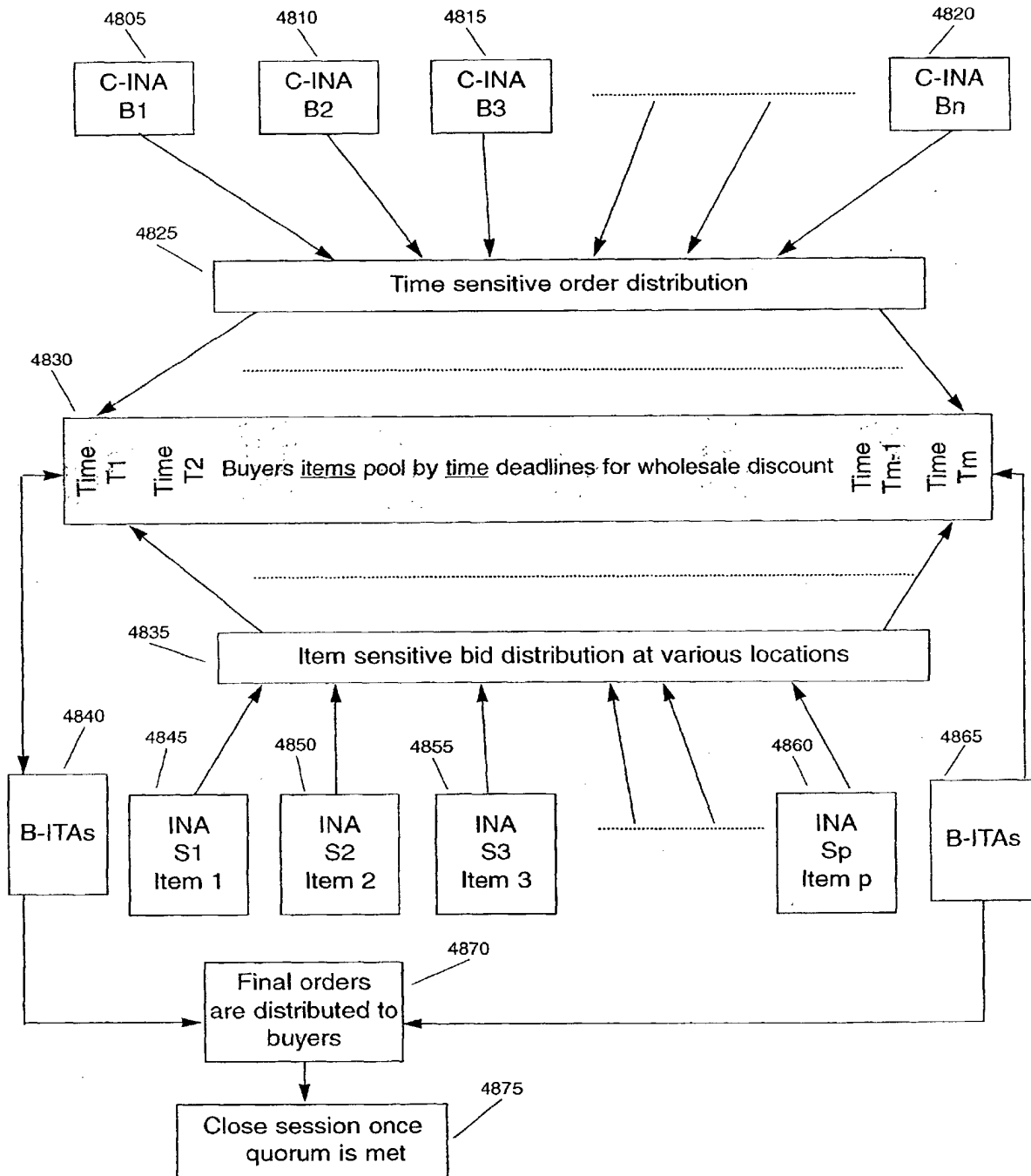


**Fig. 49: Automated Aggregation Category Structures**

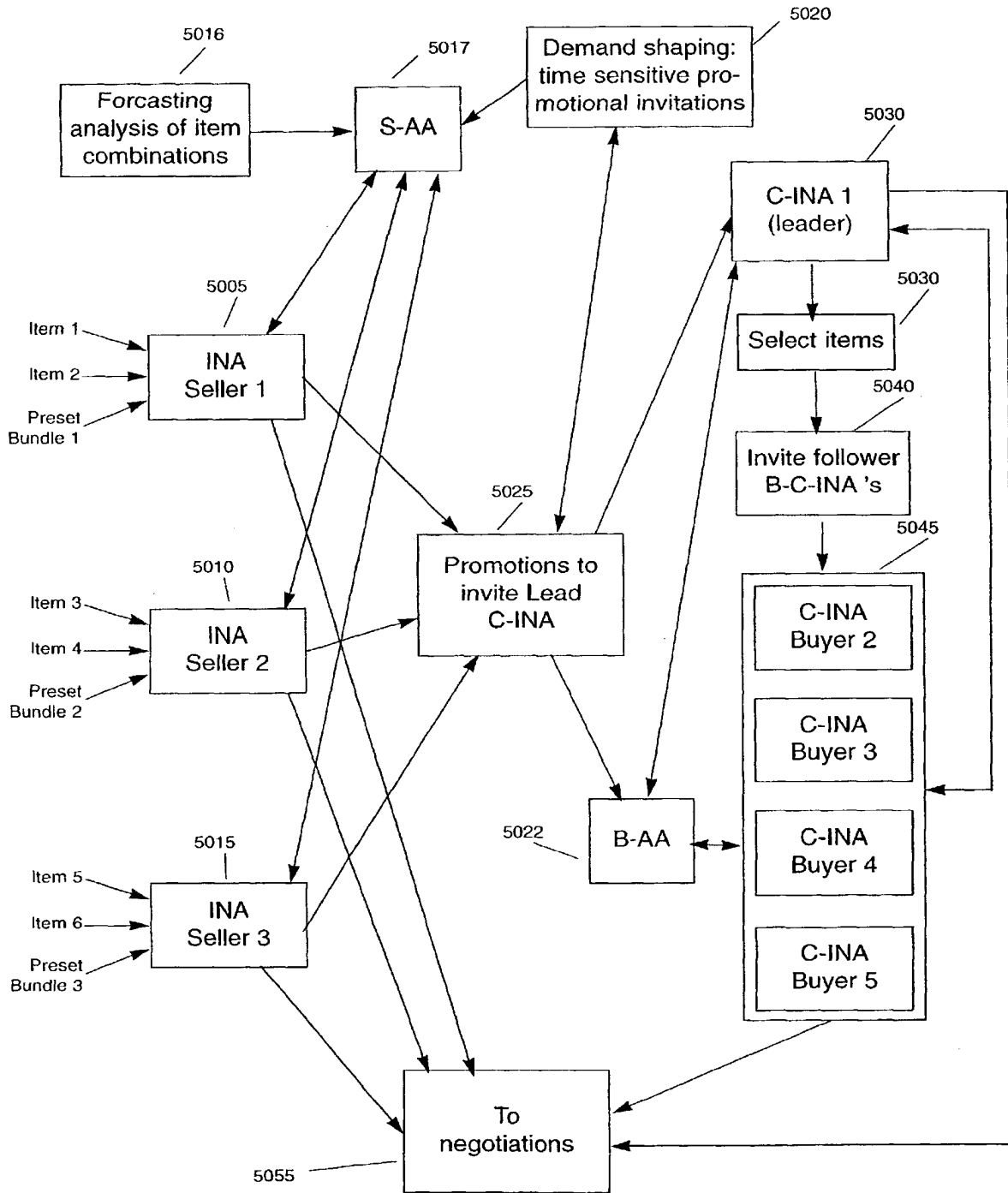
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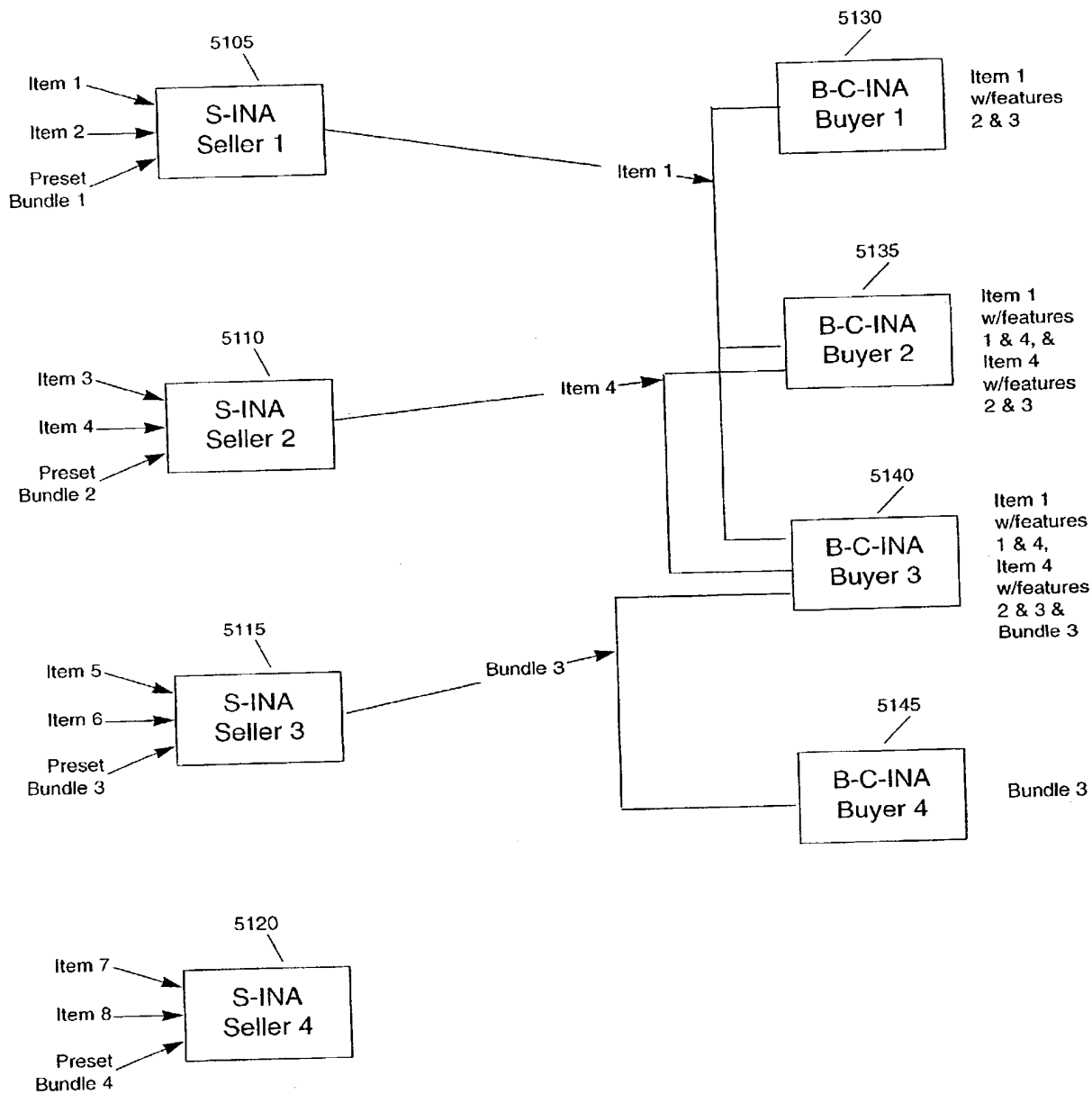
**Fig. 50: Aggregation I – Mass Pooling**



**Fig. 51: Aggregation II–Disintermediated Aggregation Method Prior To Negotiation**

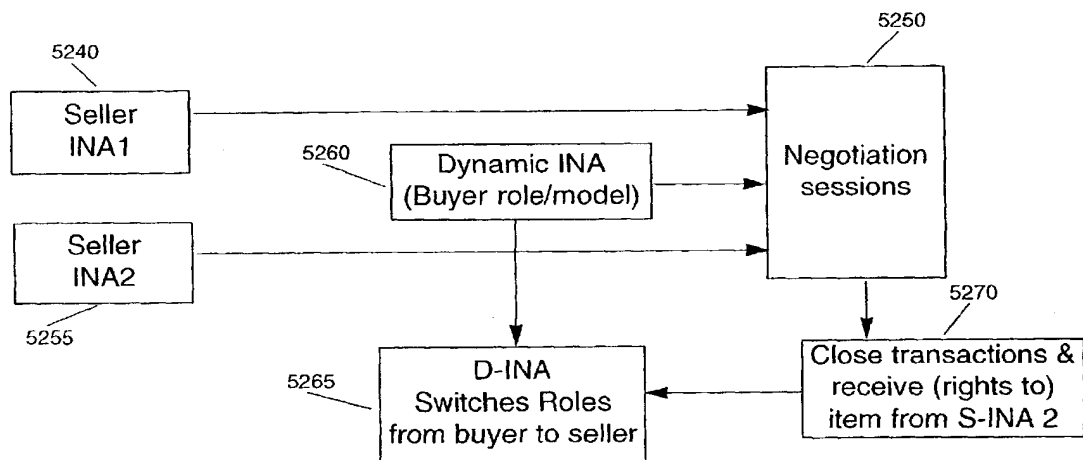


**Fig. 52: Aggregation III –  
Disintermediated Mass Customization**

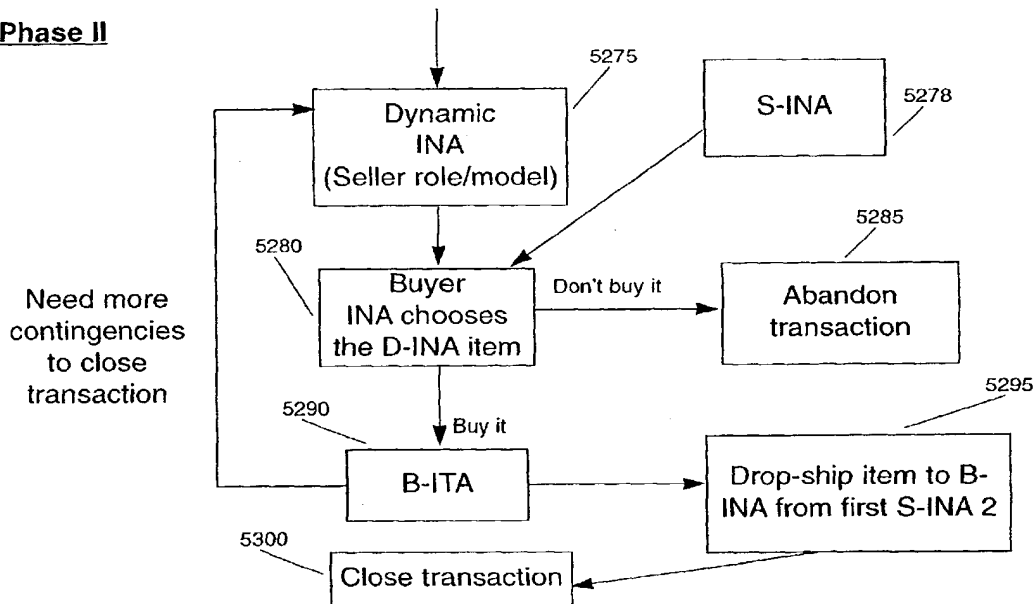


**Fig. 53: Dynamic D-INA 's Double-agents:  
Arbitrage Applications**

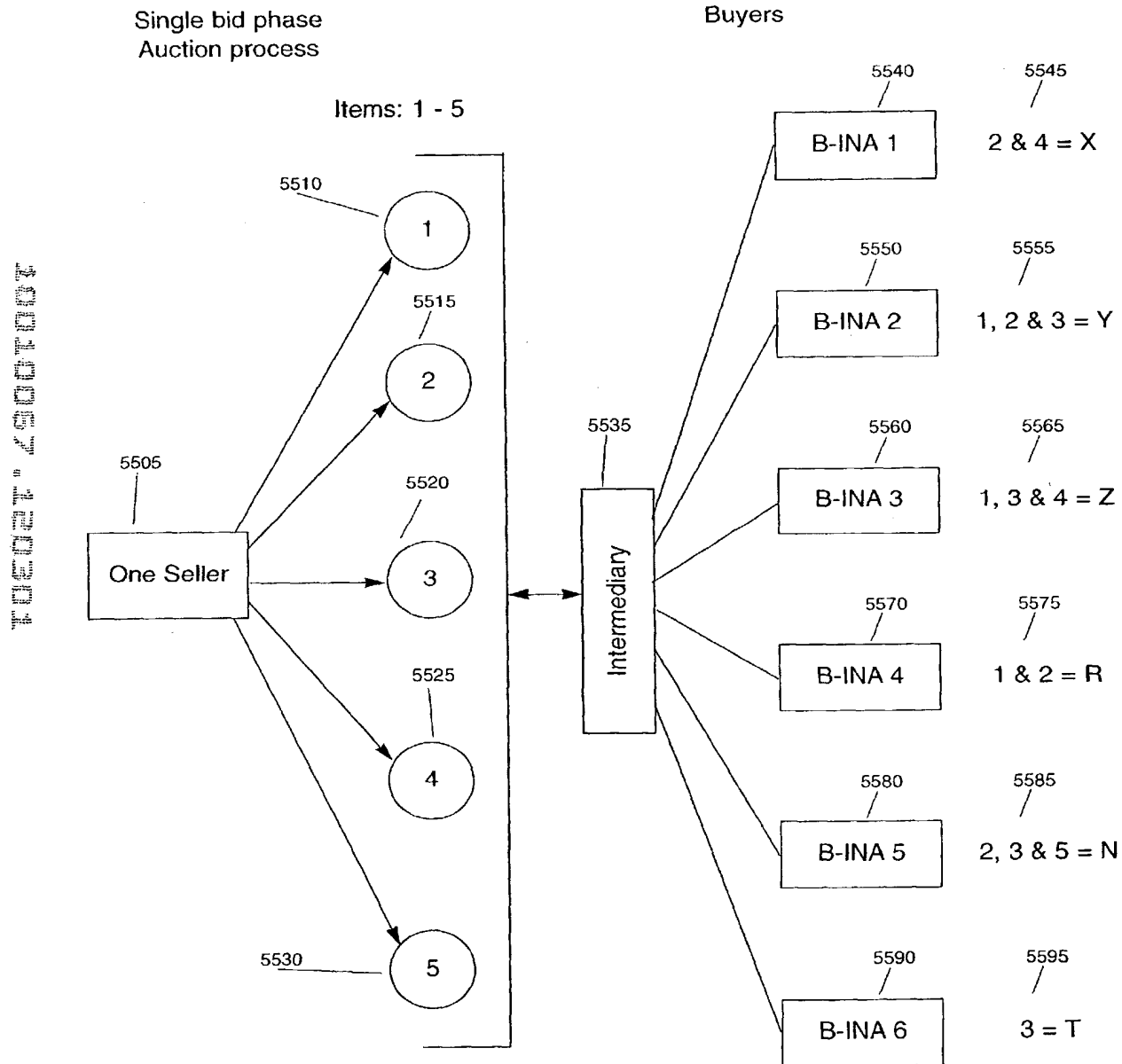
**Phase I**



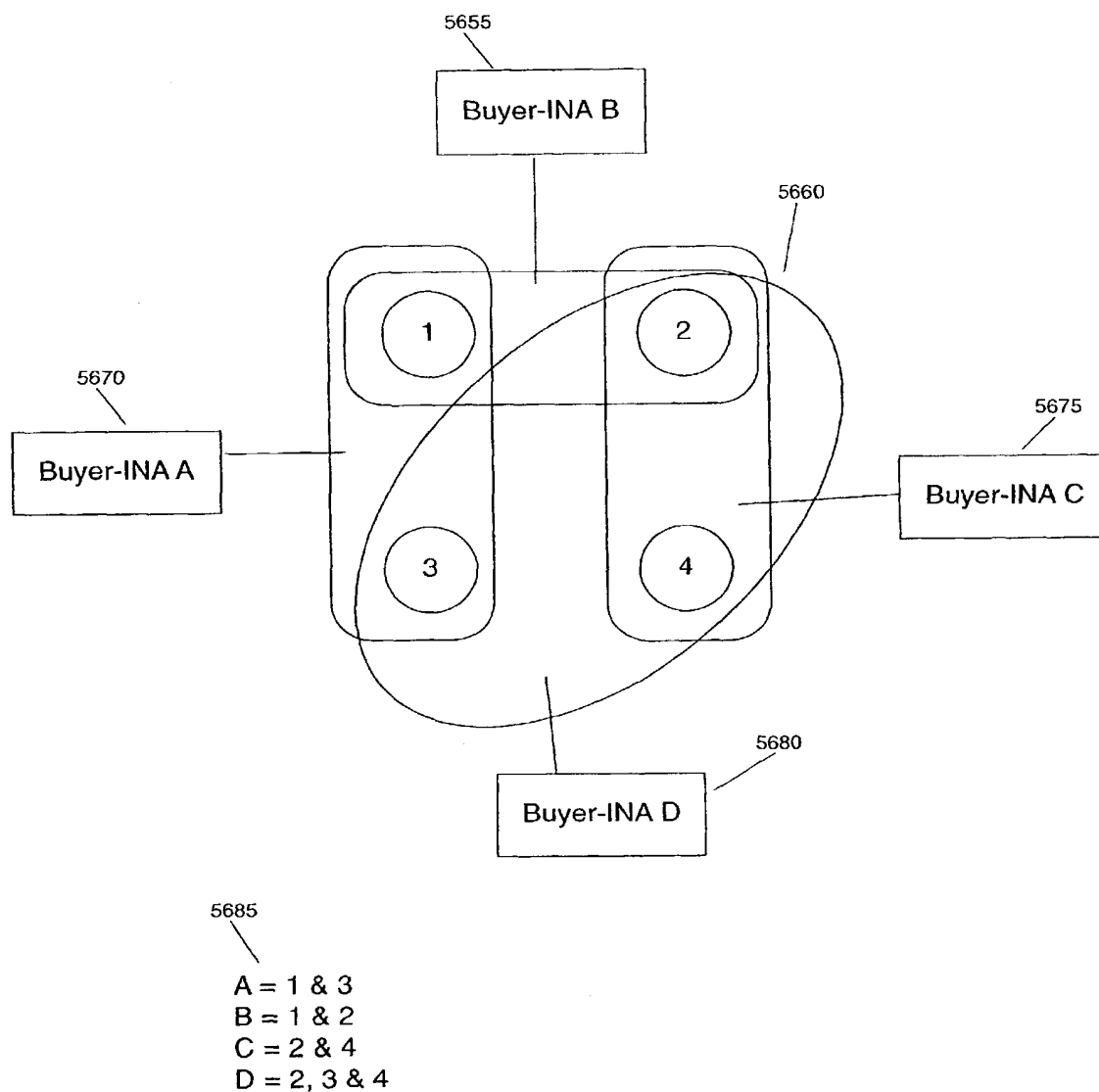
**Phase II**



**Fig. 54: Traditional Combinatorial Auction with Intermediary: Between Single Seller and Multiple Buyers**



**Fig. 55: INA Combinatorial [Double] Auction between Single Seller with Multiple Items and Multiple Buyers**



**Fig. 56: Final Session**  
**Winner Determination of Interactive Multi-lateral Auction**

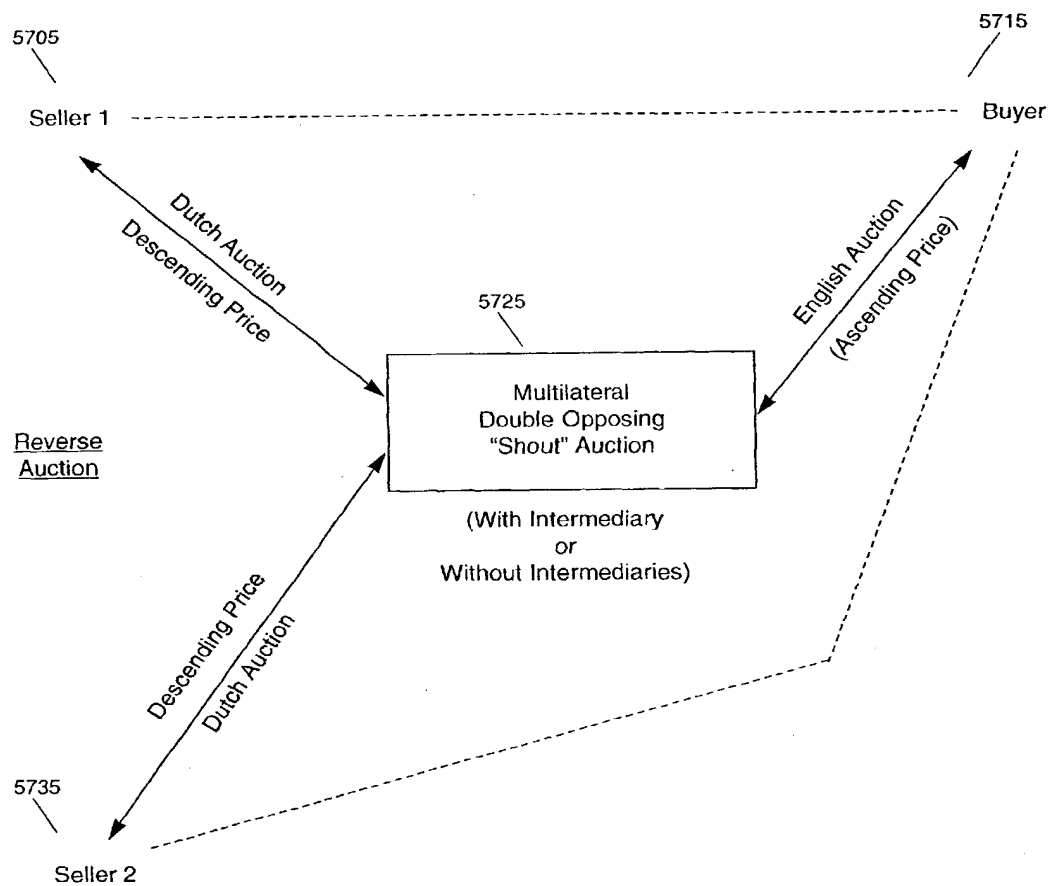
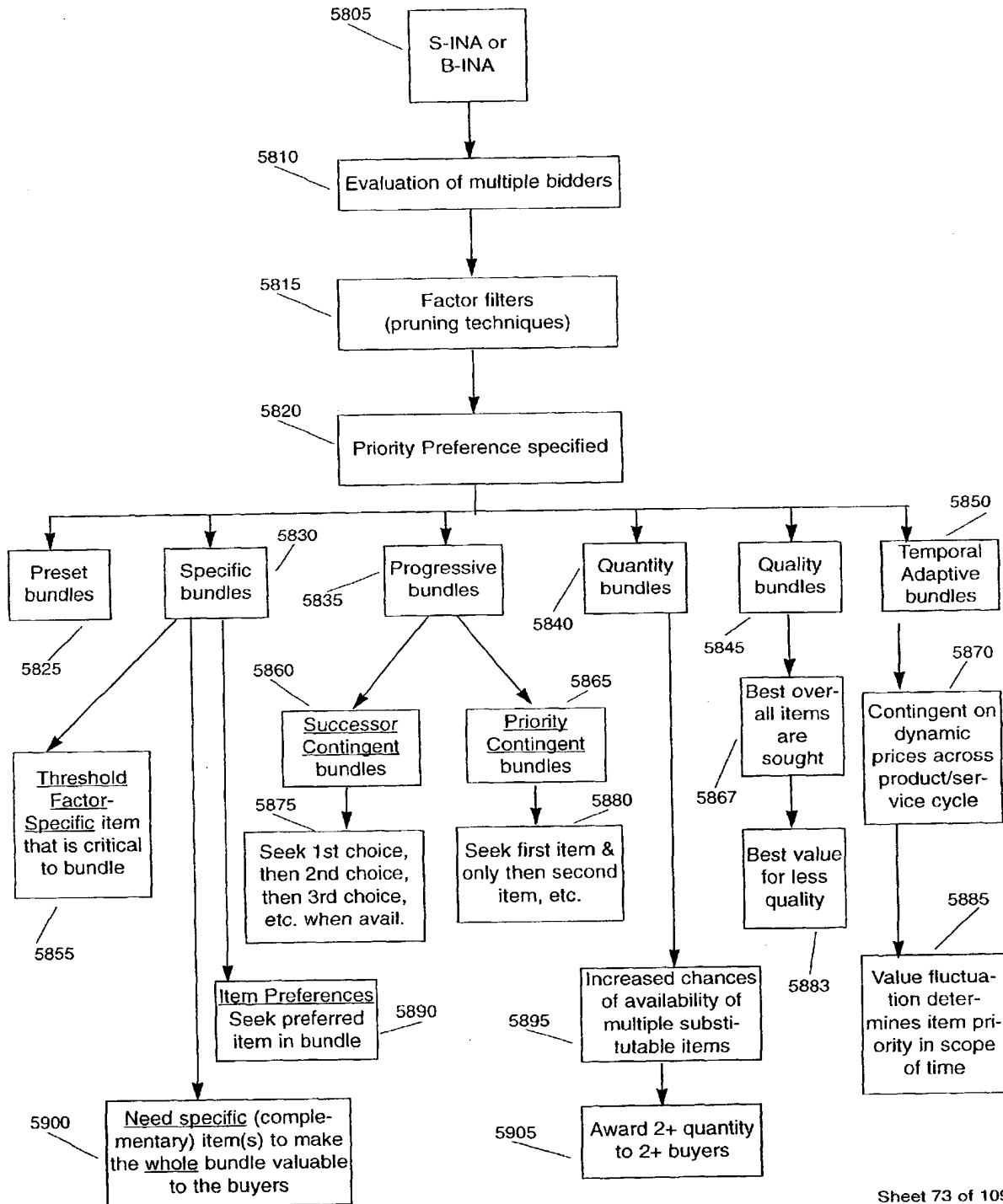
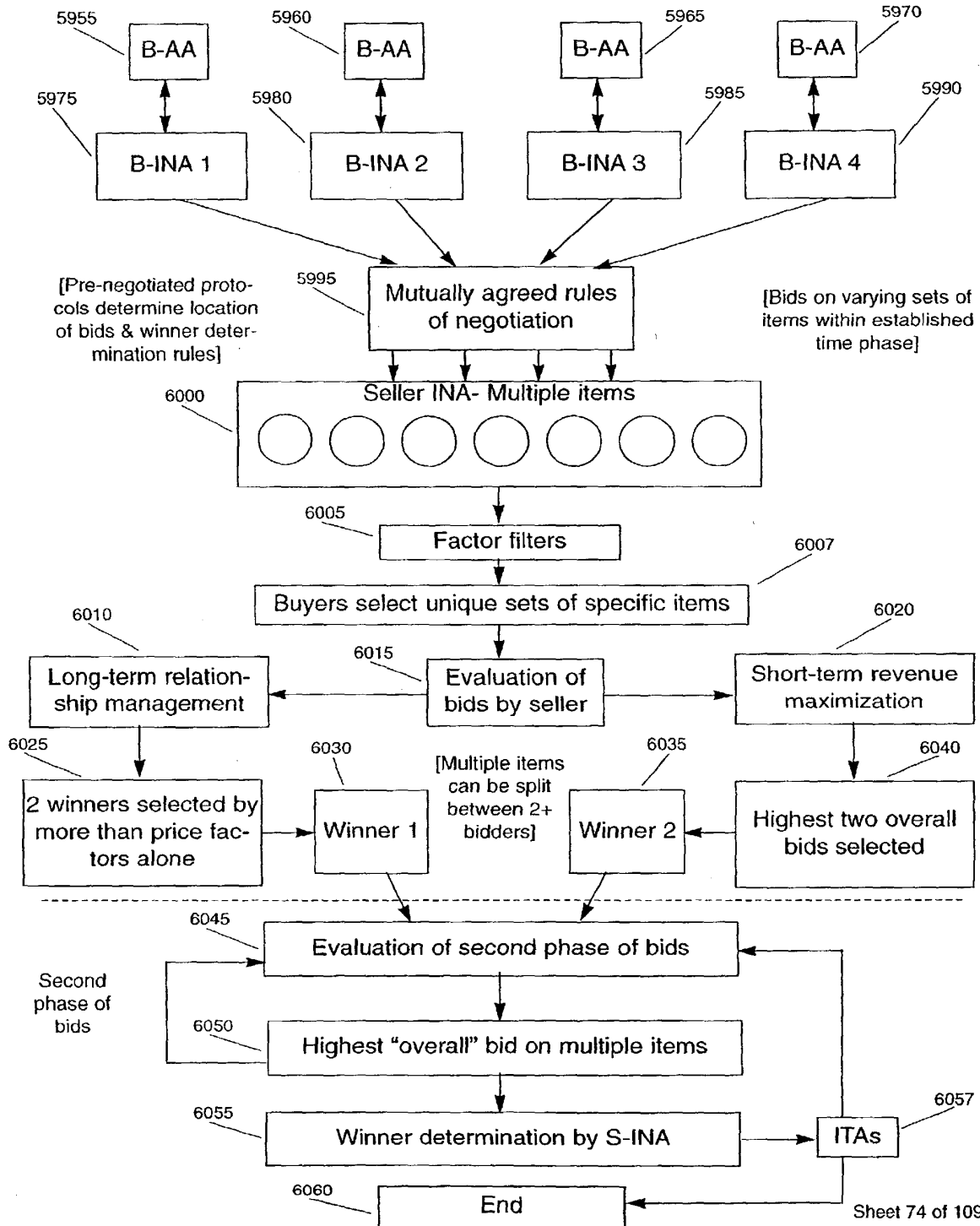




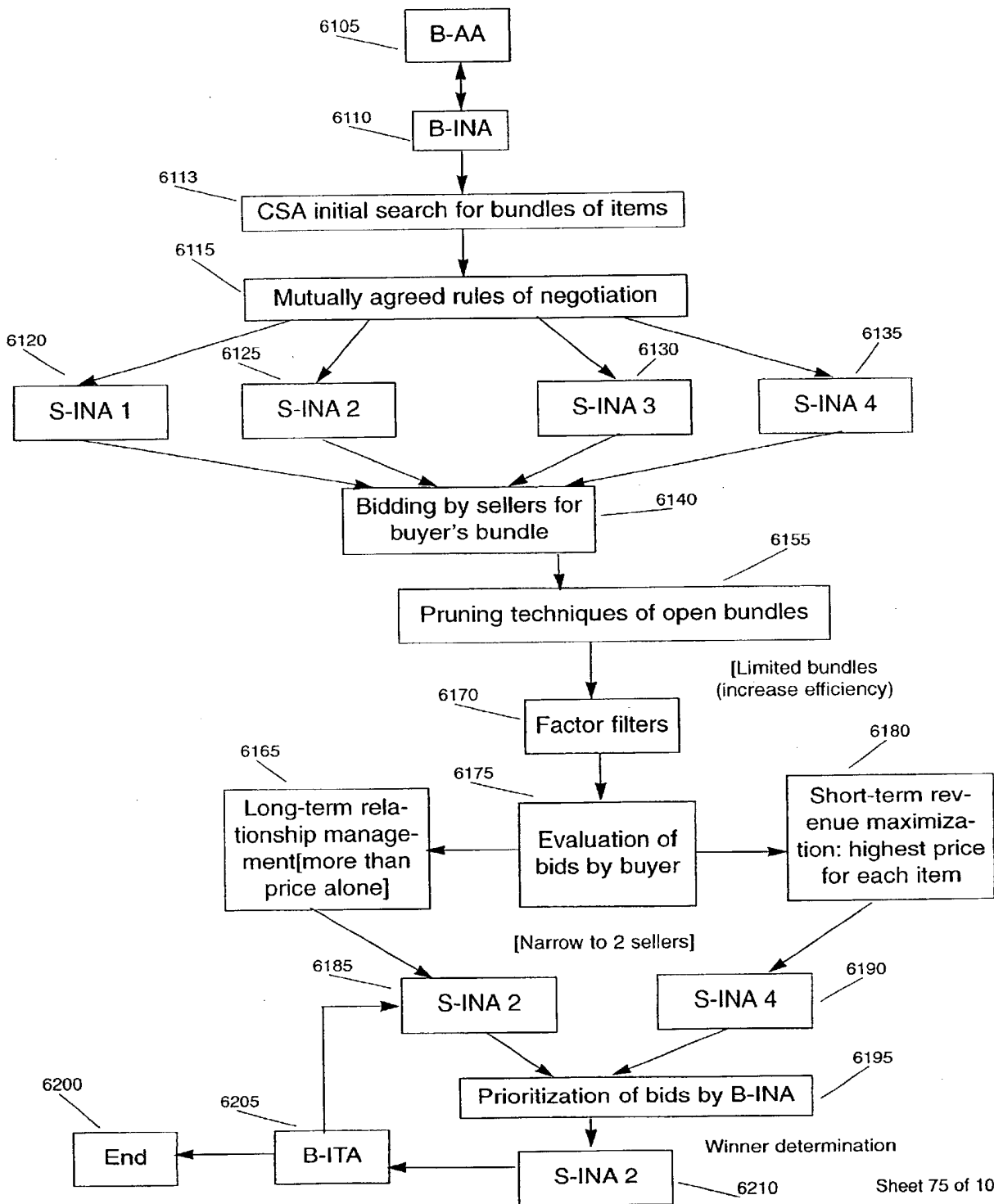
Fig. 57: Factor Filters



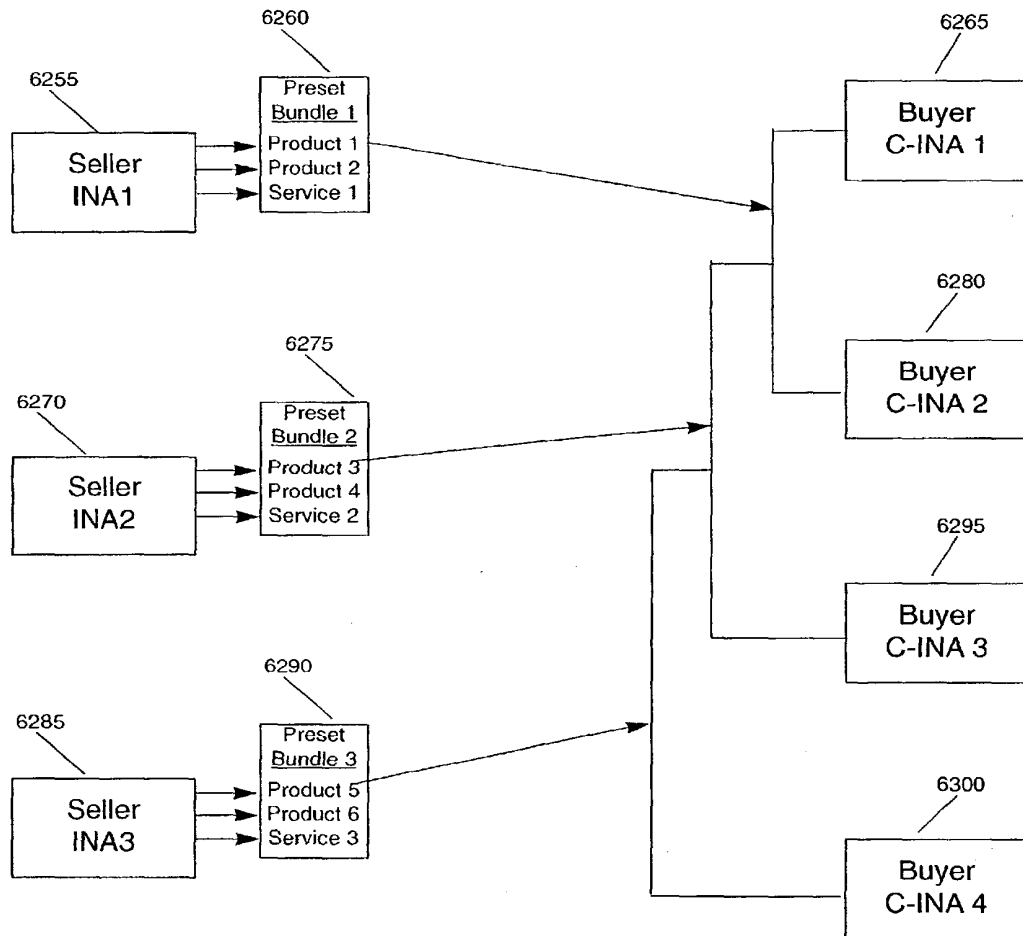
**Fig. 58: Disintermediated Multi-item Bidding From One Seller To Multiple Buyers**



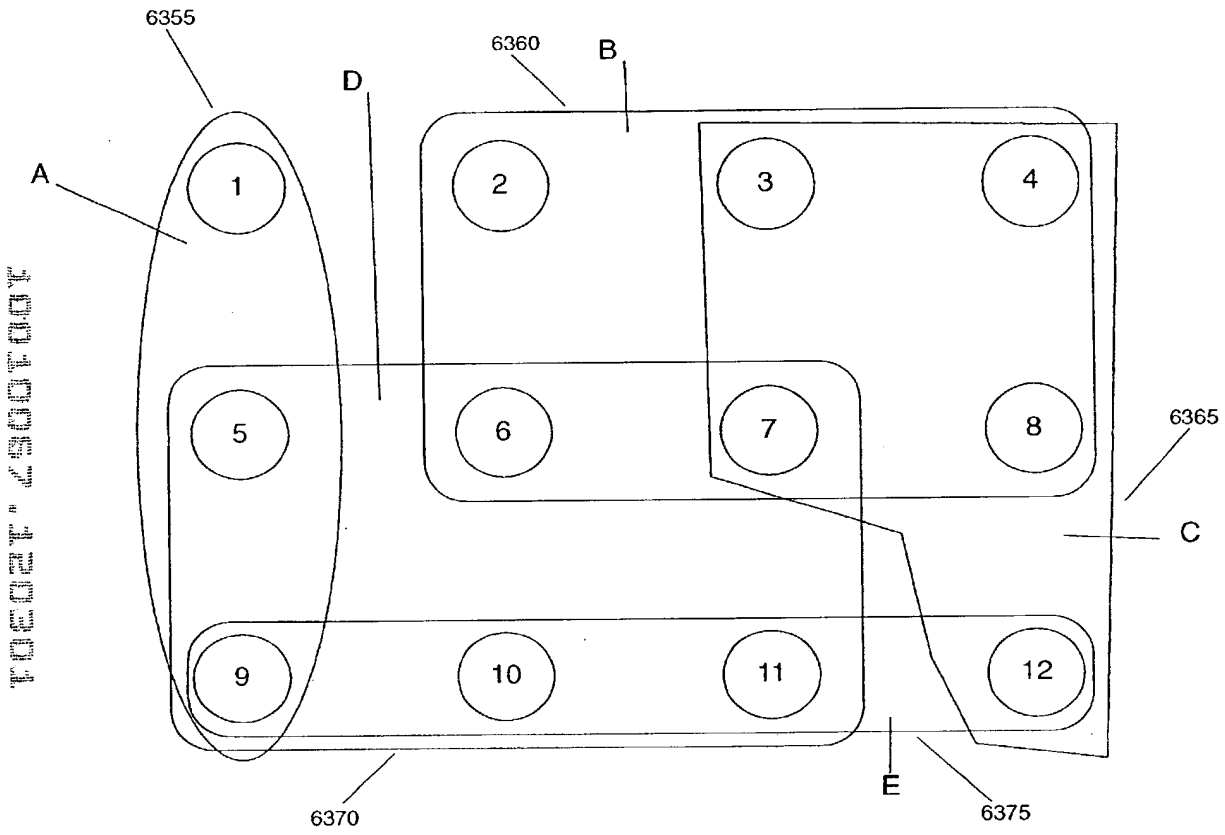
**Fig. 59: Disintermediated Multi-item Bidding between Multiple Sellers and Single Buyer**



**Fig. 60: Disintermediated Aggregation of Pre-Set Bundles between Multiple Sellers & Multiple Buyers**

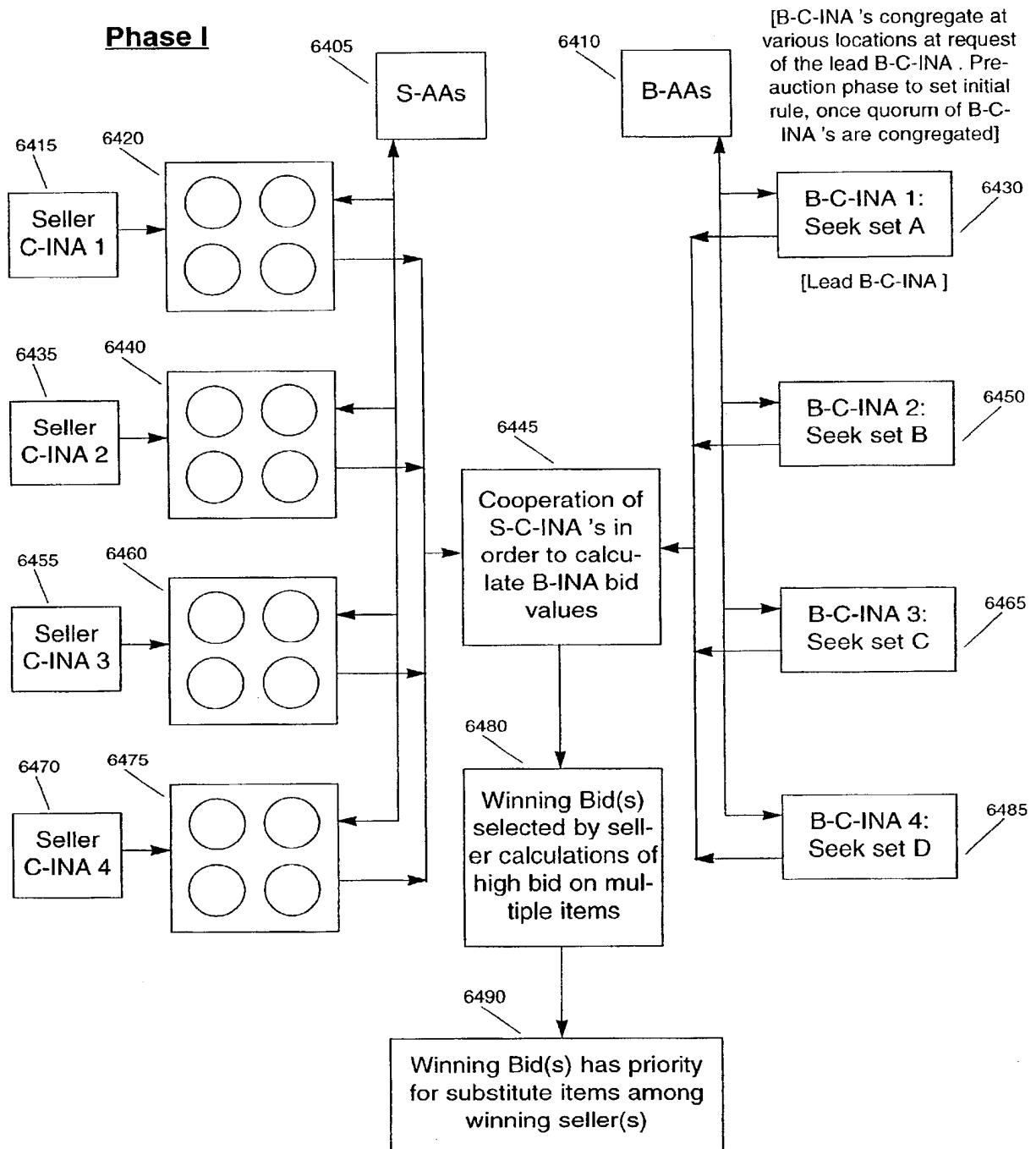


**Fig. 61: Disintermediated Multi-item Bidding Between Multiple Sellers & Multiple Buyers**

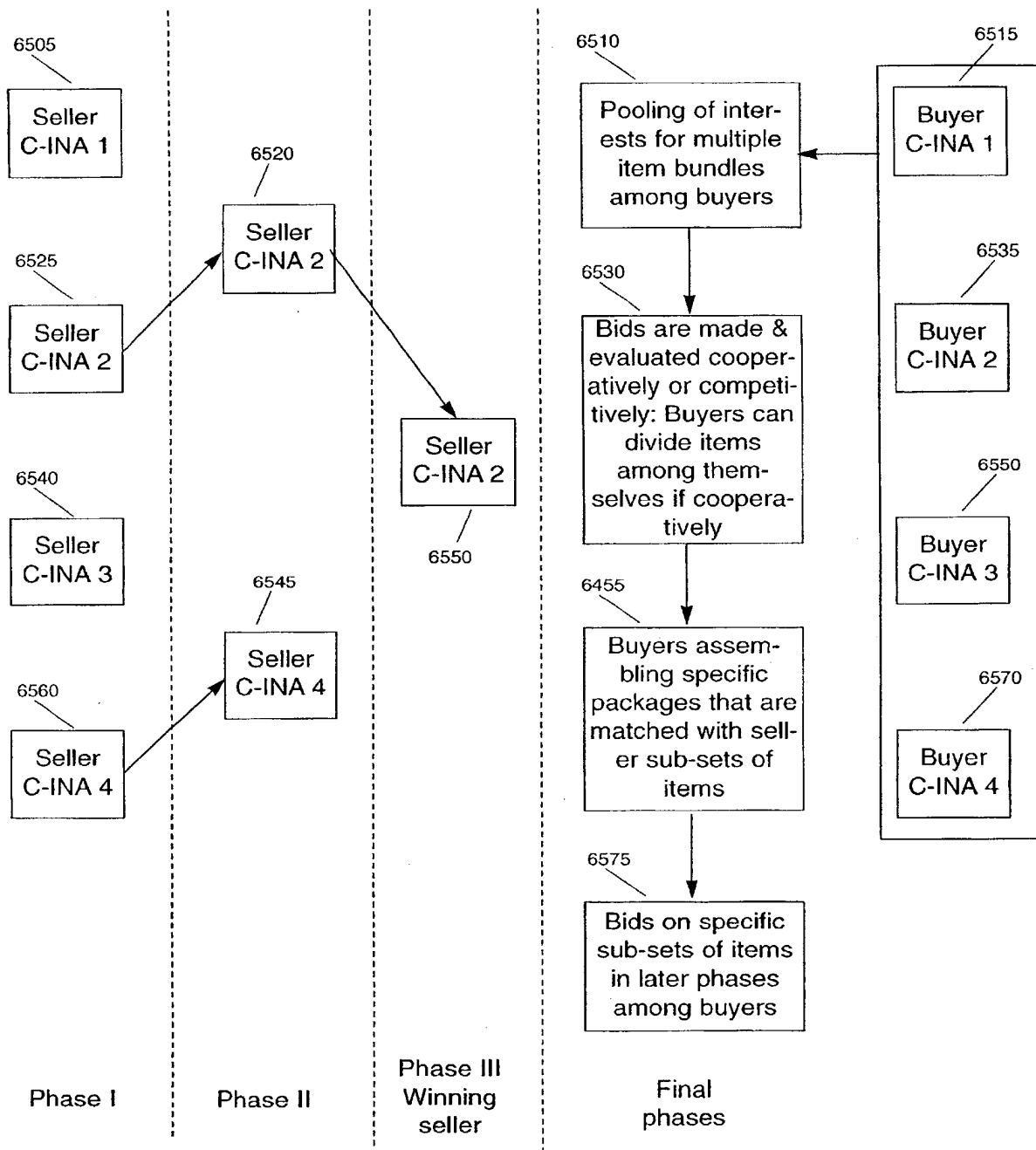


- |                    |                 |                    |
|--------------------|-----------------|--------------------|
| 1 – 4: Seller I    | Buyer Bidder A: | 1, 5, 9            |
| 5 – 8: Seller II   | Buyer Bidder B: | 2, 3, 4, 6, 7, 8   |
| 9 – 12: Seller III | Buyer Bidder C: | 3, 4, 7, 8, 12     |
|                    | Buyer Bidder D: | 5, 6, 7, 9, 10, 11 |
|                    | Buyer Bidder E: | 9, 10, 11, 12      |

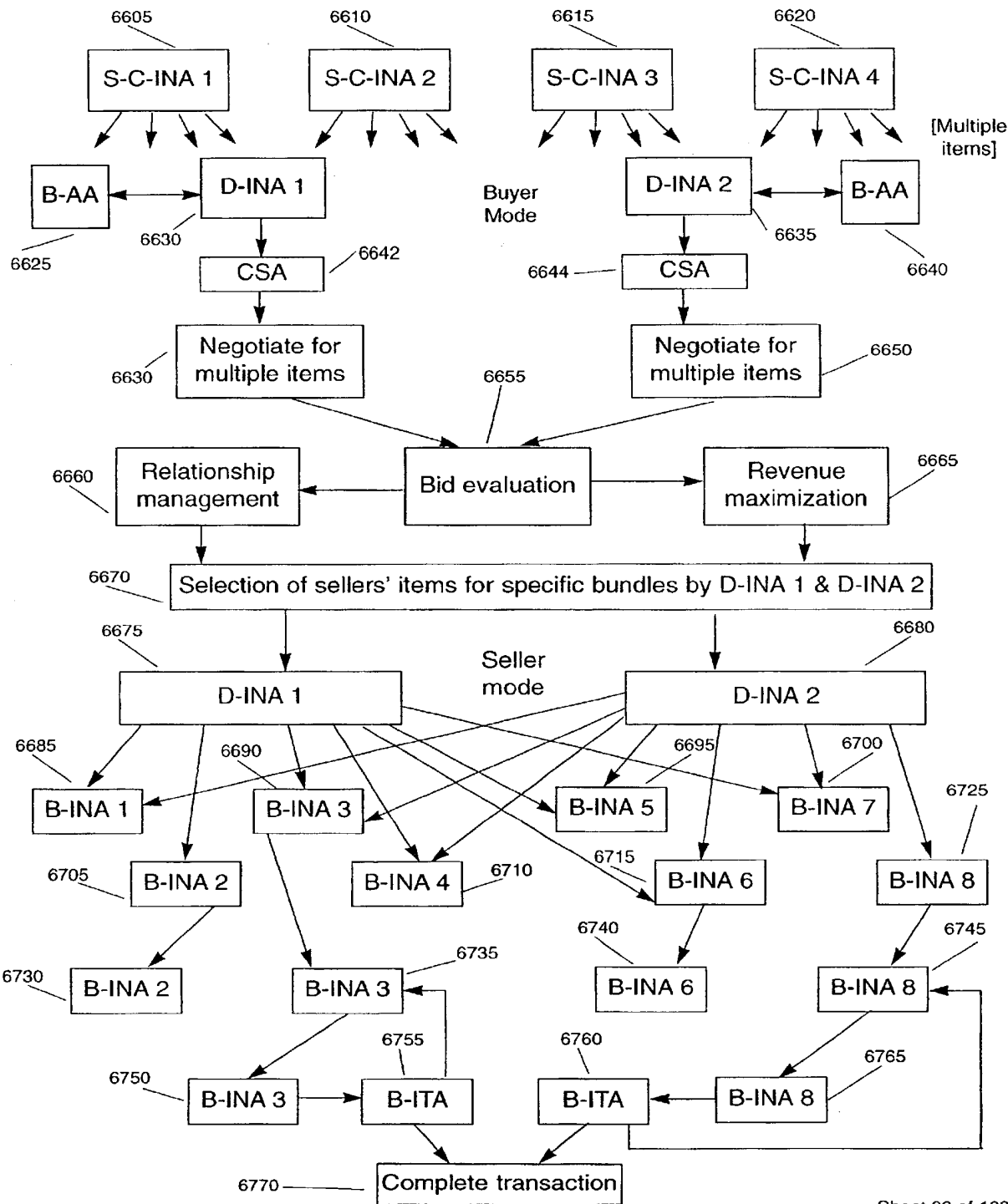
**Fig. 62A: Disintermediated Aggregation Of Multiple-item Bundles Bidding From Multiple Sellers To Multiple Buyers using C-INA 's**



**Fig. 62B: Disintermediated Aggregation Of Multiple-item Bundles Bidding From Multiple Sellers To Multiple Buyers using C-INA 's (continued)**



**Fig. 63: Disintermediated Arbitrage Of Multi-item Bundles Between Multiple Sellers & Multiple Buyers using D-INA 's**





## **Fig. 64: Multifactorial Bidding Approaches**

### **Sorting By Item Variables**

Quality

Attribute – color, style, etc.

Quantity

Availability (now or later)

Delivery Time & Terms

Size

Dynamic Pricing Across product/service cycle

Brand/manufacturer

Configuration

Features

Additional options

Combinations of various features

Price

Payment Method

Payment Terms

Location

**Fig. 65: Example of Multiple Feature Factors: Personal Computer Configurations**

Manu.	CPU/ Mother board	Brand	OS	RAM	HDD	Modem & ISP contract.	DVD	Monitor	Price
Intel	500-ABC	IBM	MS	64	10	56 kbs	DVD	15 in	
Intel	500-ABC	Dell	MS	128	10	56 kbs	DVD	17 in	
AMD	500-XYZ	Gateway	MS	128	20	56/ISP	DVD	19 in	
AMD	800-XYZ	HP	MS	128	0	56/ISP	DVD	17 in	
AMD	800-ABC	IBM	MS	256	20	56/ISP	DVD	17 in	
AMD	800-ABC	Dell	Linux	256	20	128	DVD-RAM	17 in	
Intel	800-ABC	Gateway	Linux	256	30	128	DVD-RAM	17 in	
Intel	800-ABC	HP	Linux	256	30	128	DVD-RAM	17 in	
Intel	1.2-XYZ	IMB	Linux	256	30	128/ISP	DVD-RAM	17 in	
Intel	1.2XYZ	Dell	Linux	256	40	128/ISP	DVD-RAM	17 in	
Intel	1.2-ABC	Gateway	MS	256	40	128/ISP	DVD-RAM	19 in	
Intel	1.2-ABC	HP	MS	256	40	256	DVD-RAM	19 in	
AMD	1.2-ABC	IBM	MS	256	40	256	DVD-RAM	19 in	
AMD	1.2-ABC	Dell	MS	512	60	256	DVD	19 in	
AMD	1.2-XYZ	Gateway	MS	512	60	256/ISP	DVD	19 in	
AMD	1.8-XYZ	HP	MS	256	60	256/ISP	DVD	19 in	
AMD	1.8-XYZ	IBM	Linux	256	60	1.2mbs	DVD-RAM	21 in	
Intel	1.8-XYZ	Dell	Linux	256	80	1.2mbs	DVD-RAM	21 in	
Intel	1.8-XYZ	Gateway	Linux	512	80	1.2mbs	DVD-RAM	21 in	
Intel	2.4-ABC	HP	Linux	512	80	1.2/ISP	DVD-RAM	21 in	
Intel	2.4-ABC	Sony	MS	512	120	1.2/ISP	DVD	21 in	
AMD	2.4-ABC	Sony	MS	1.2	120	1.2/ISP	DVD	21 in	

Quantity – Discounts – 2-5, 5-9, 11-19, 21-29, 30-99, 100-499, 500-1999, etc.

## **Fig. 66: Examples of Categories of Multi-item Bundles**

1. Computer Hardware configurations – RAM, HDD, CPU, monitor
2. Computer Hardware& Software
3. Computer Hardware & Services
4. Office equipment computer, printer, copier, fax, phone
5. Telephone equipment & services – local and long distance
6. Telecom capacity – rev. maximization across demand cycle
7. Electronic equipment – A/V combinations & software accessories
8. Photo equipment – camera, lenses, accessories, film, digital media
9. Airline tickets – time constraints to sell multiple seats to maximize revenue
10. Machines, machine parts, machine accessories
11. Cars/trucks & accessories
12. Wardrobe combinations, pants, shirts, coats
13. Real Estate – contiguous properties
14. Communications spectrum – contiguous properties
15. Gems
16. Railroad & trucking scheduling
17. Art, antiques, rugs, etc.
18. Housing combinations
19. Intellectual Property combinations
20. Pharmaceuticals
21. Chemicals

**Fig. 67: S-ITA System Architecture**

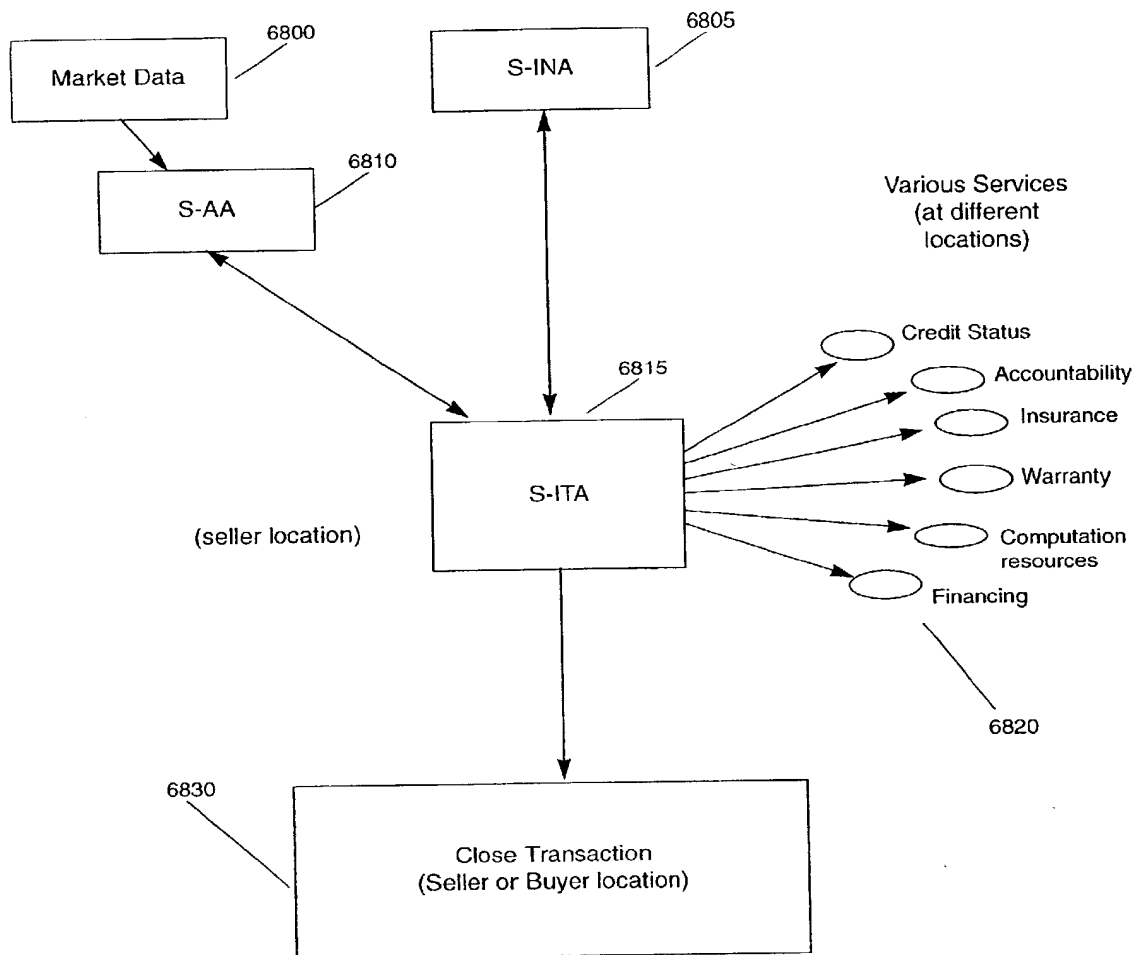
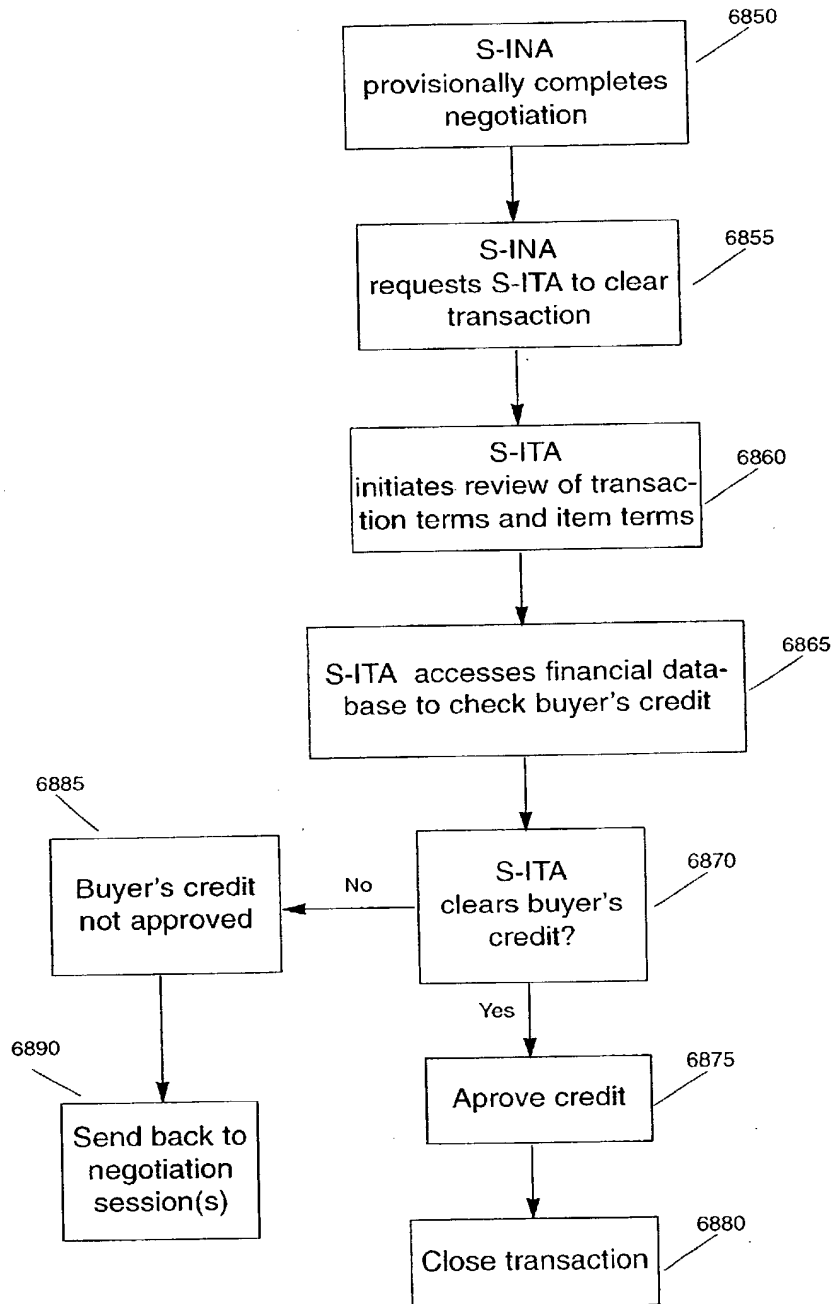
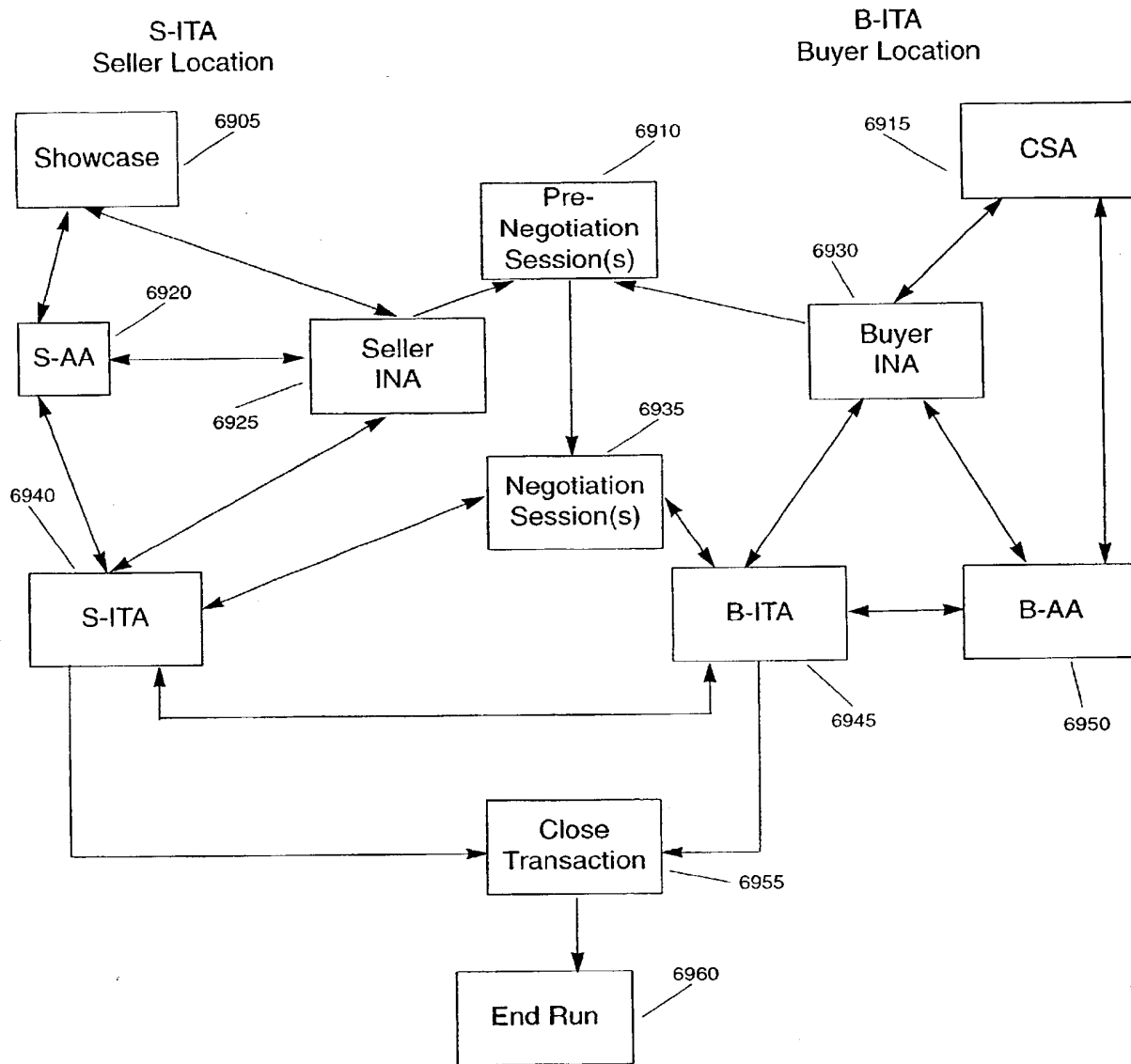


Fig. 68: S-ITA Operation



**Fig. 69: S-ITA and B-ITA System Process  
in Final Negotiation with One Seller**



**Fig. 70: ITA Service Categories: Buyer & Seller Roles**

<u>s – ITA Services</u>	<u>b – ITA Services</u>	<u>dual – ITA Services</u>
<u>Info.</u>	<u>Info.</u>	<u>Info.</u>
<u>AA functions</u>	<u>AA functions</u>	
Superscore	Info about market, companies.,	
Accountability	economy, industry,	
Credit info.	products, etc.	
<u>Services</u>	<u>Services</u>	<u>Services</u>
Compliance – legal	Promotion discounts	Compliance – legal
Compliance – tax	Warranty	Compliance – tax
RMO's	Insurance	RMO's
finance/credit		finance/credit
payment processing		payment processing
Fulfillment – shipping/tracking		Fulfillment – shipping/tracking
due diligence		due diligence
escrow		escrow
report generator		report generator
post-sale feedback		post-sale feedback

**Fig. 71: ITA Services**

Accountability index → prior experience online  
→ credit score & credit check

Financial credit module

— matching buyer with appropriate lender

Contracting module

Compliance module

Legal compliance

Federal/state/international rules

Tax compliance

International customs compliance

Risk management options

Payment processing module

— method of payments

— billing/invoice

— financial clearing and account crediting

Shipping/ delivery terms/tracking

Warranty Info & conditions

Insurance risks

Bookkeeping & accounting function

Due diligence

Escrow process

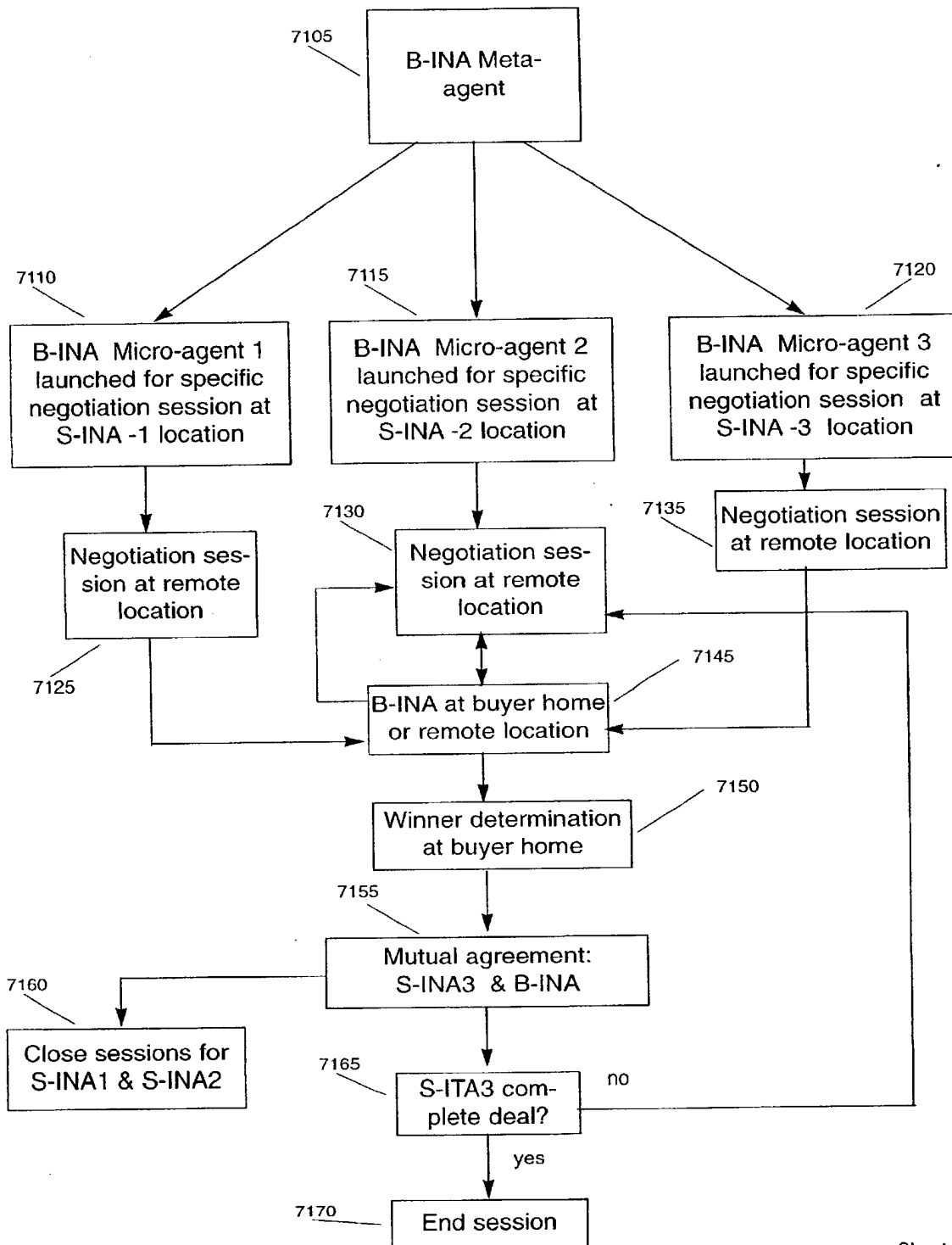
Report generator

Accelerated processing for high rated customer

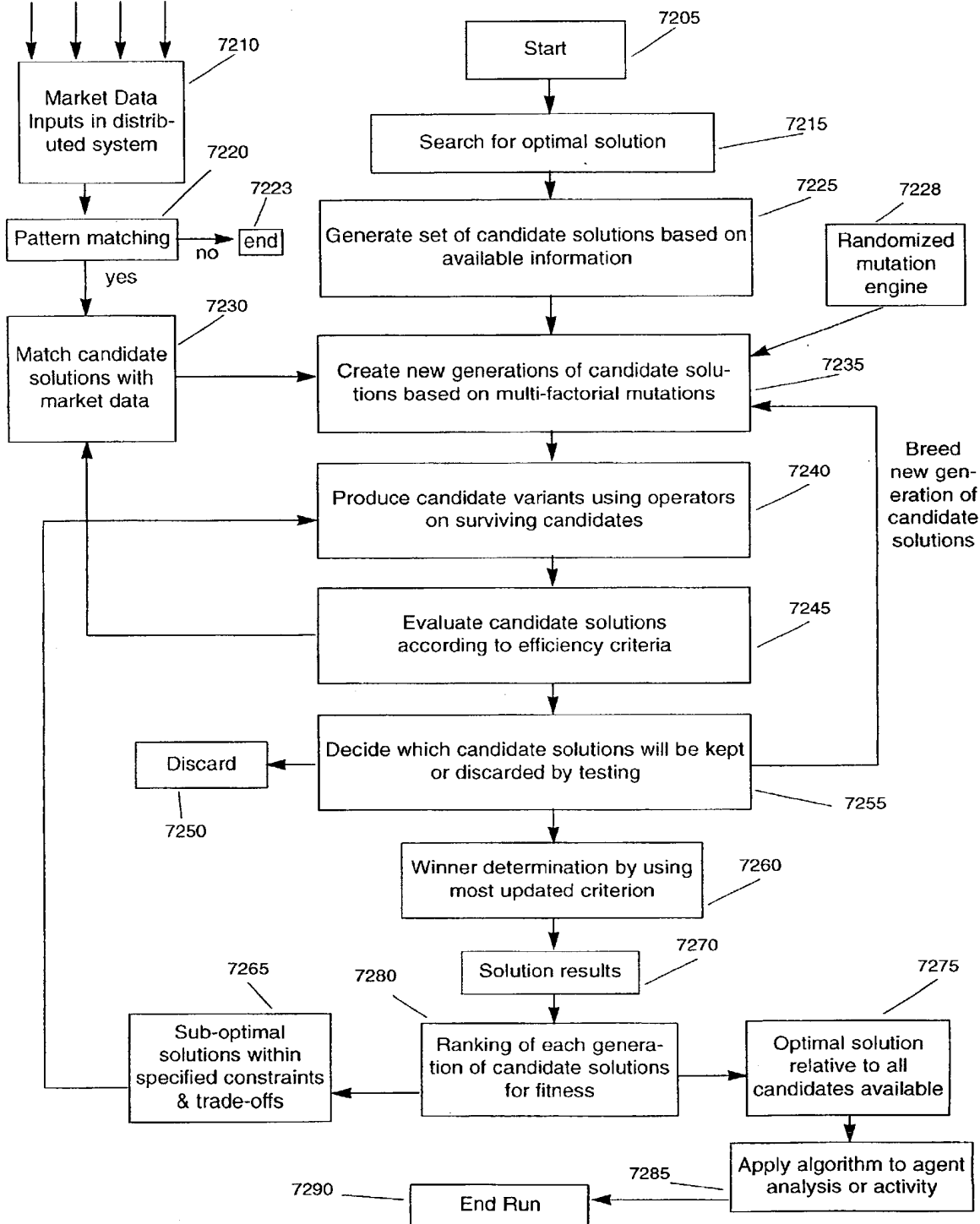
Post sale feedback



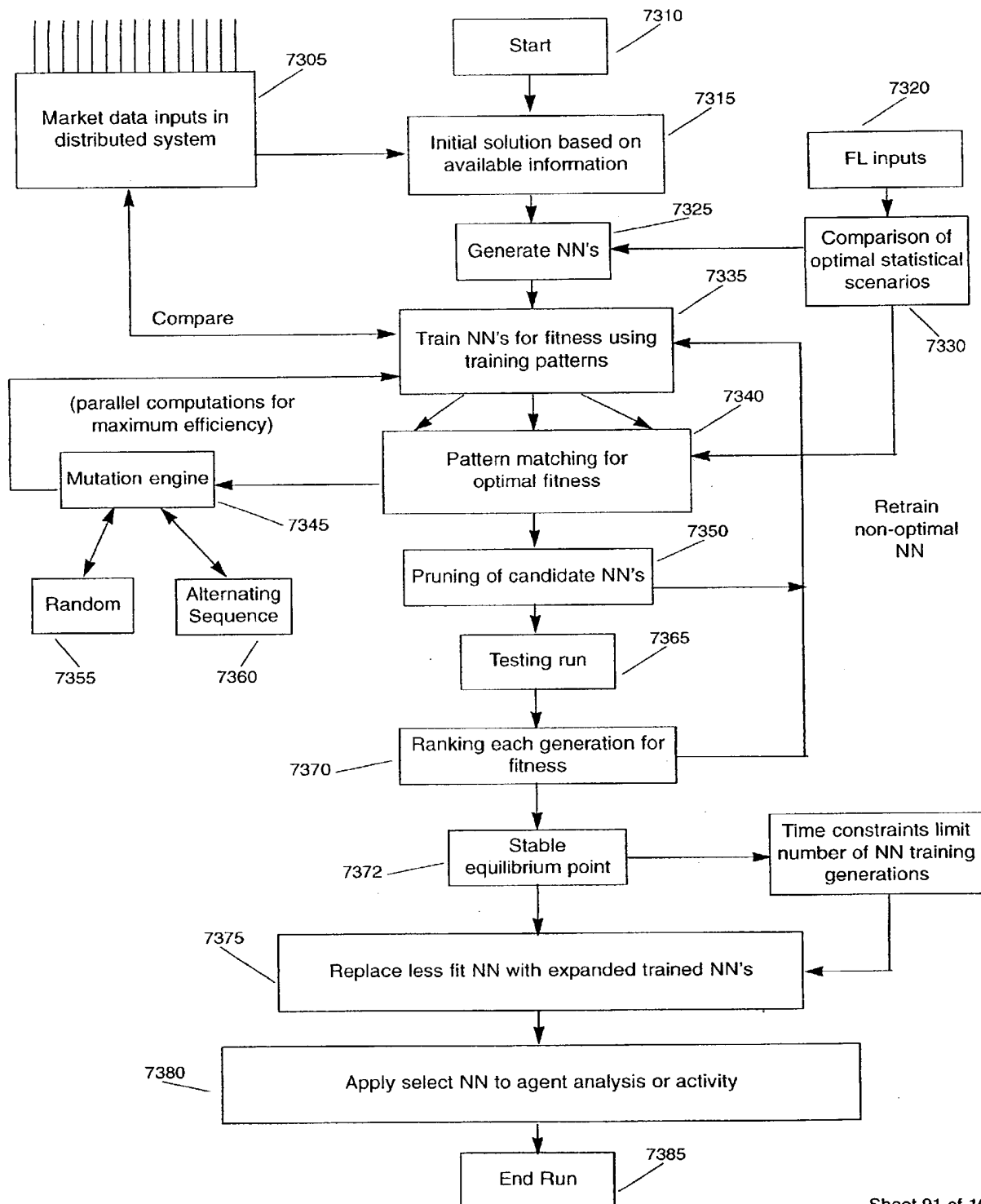
**Fig. 72: B-INA Micro-agents with Mobility**



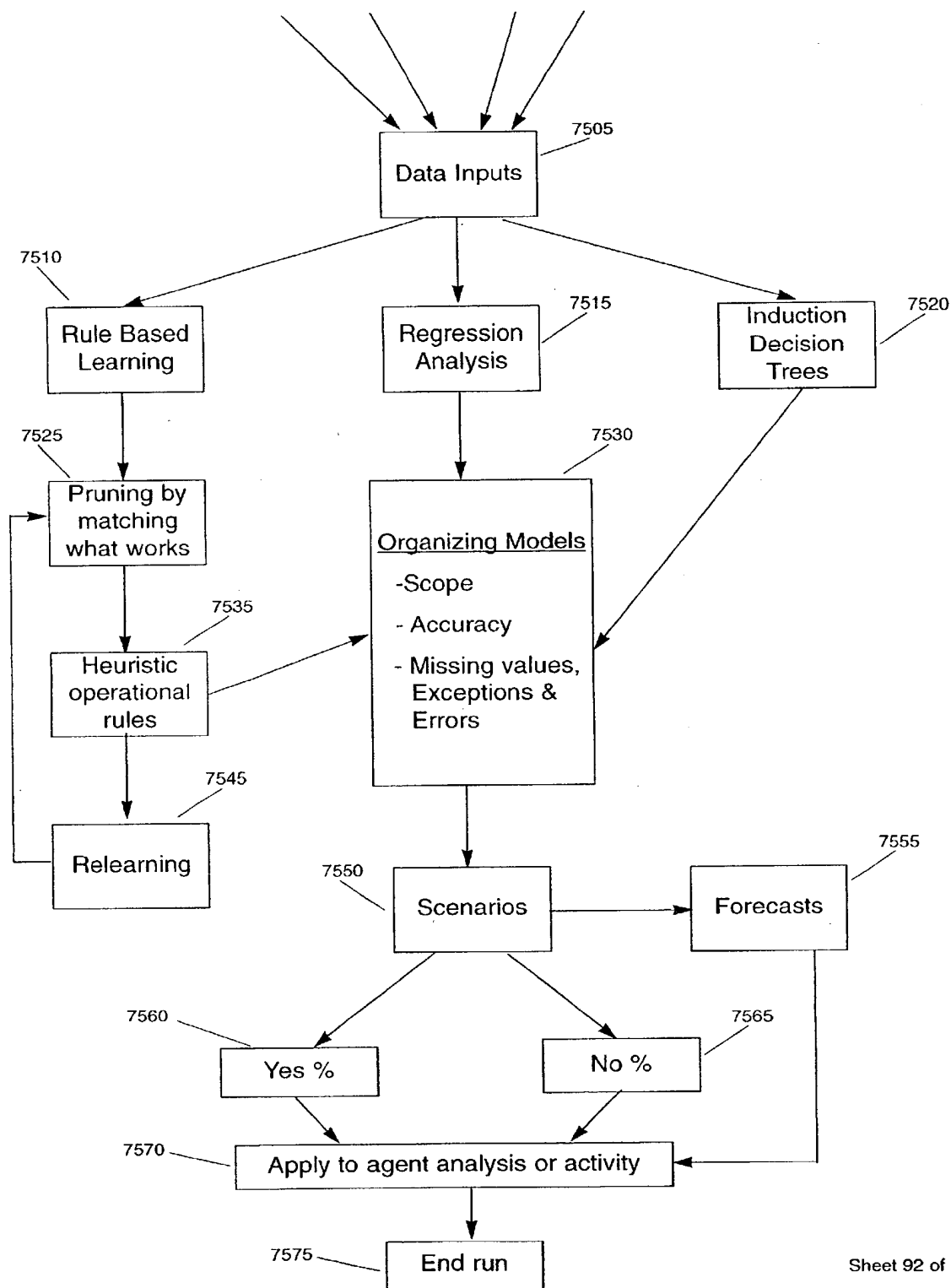
**Fig. 73: Genetic Algorithms Applied to Multi-Agent System**



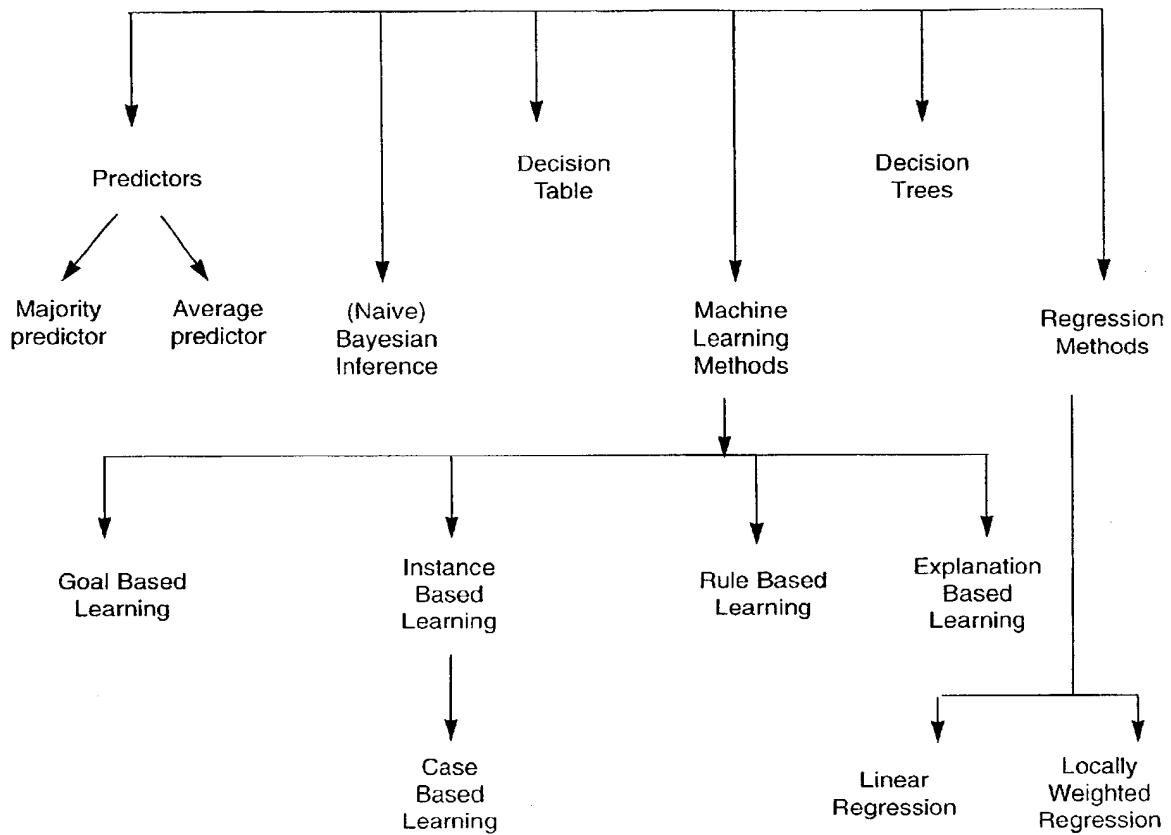
**Fig. 74: Neural Networks Applied to Multi-Agent System**



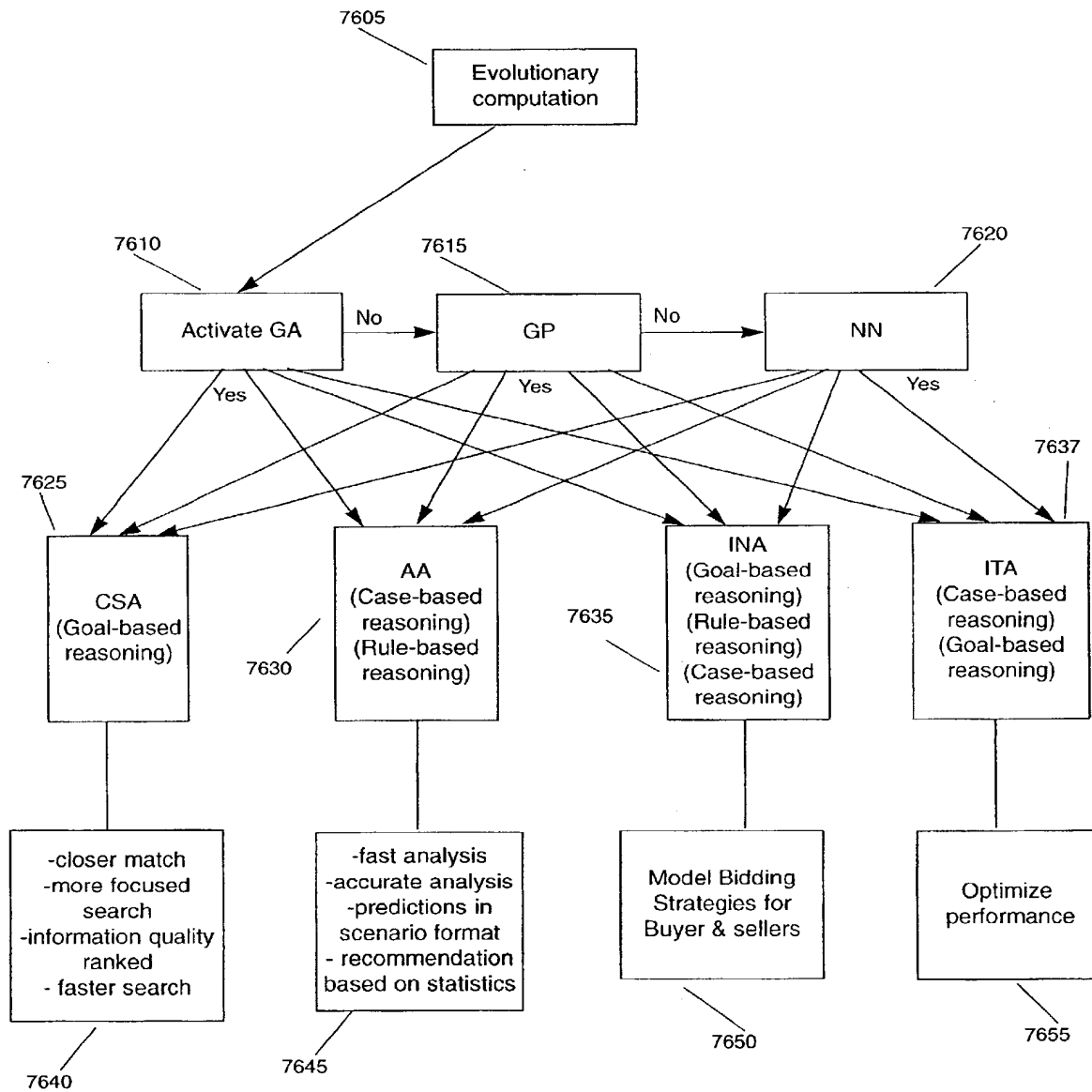
**Fig. 75: Genetic Programming System Process**



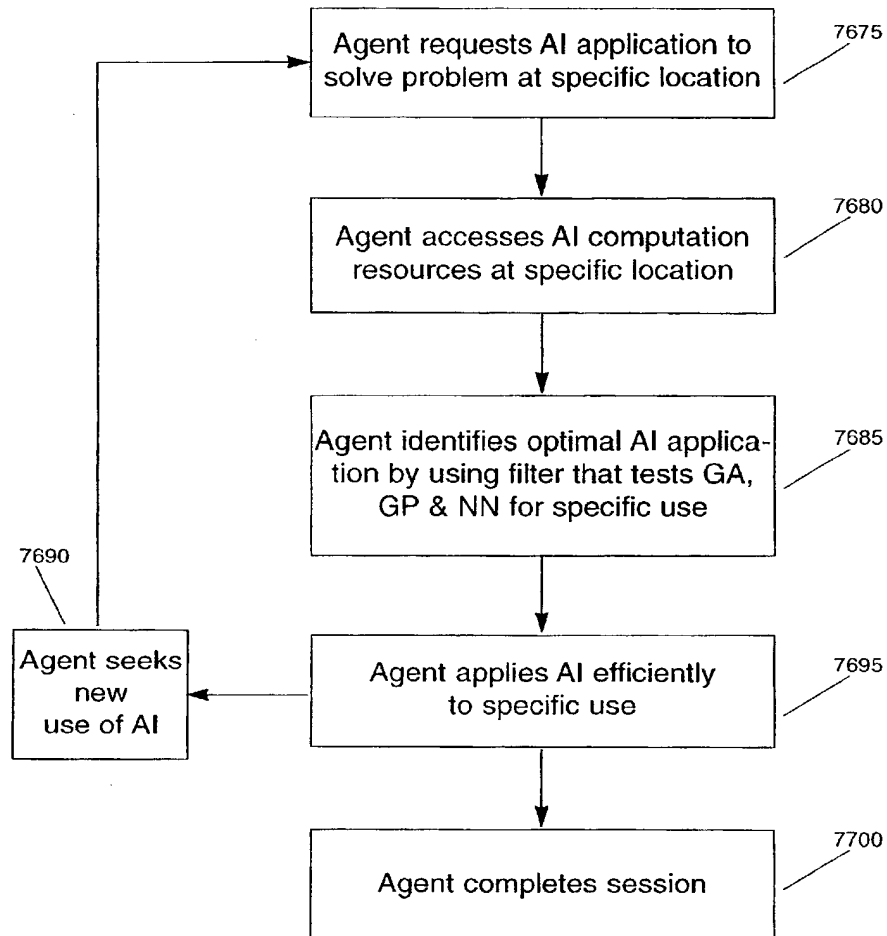
**Fig. 76: Genetic Programming Learning Schemas**



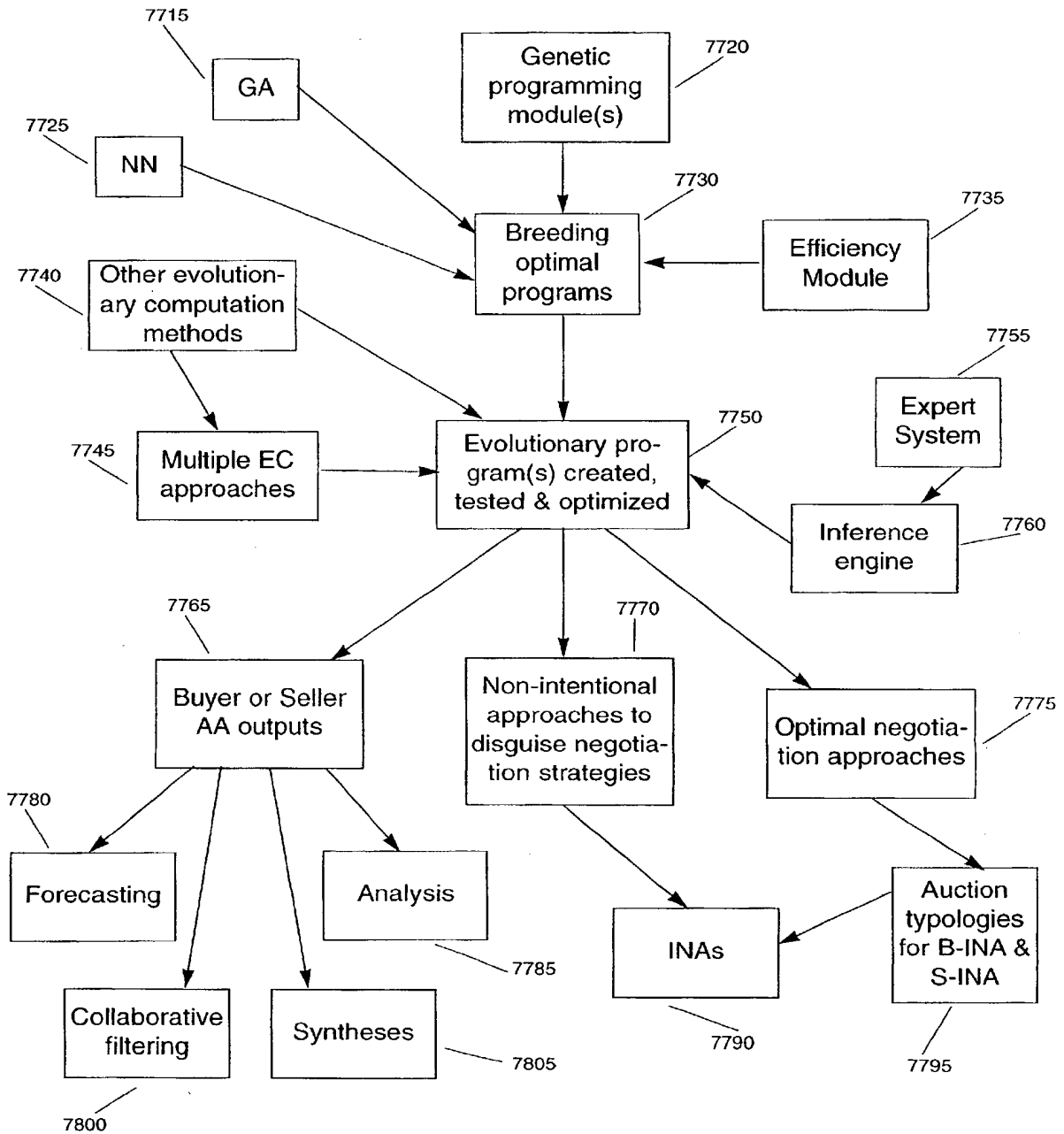
**Fig. 77: Evolutionary Computation Applications to Agents**



**Fig. 78: AI Applied to Agency in a Distributed System**

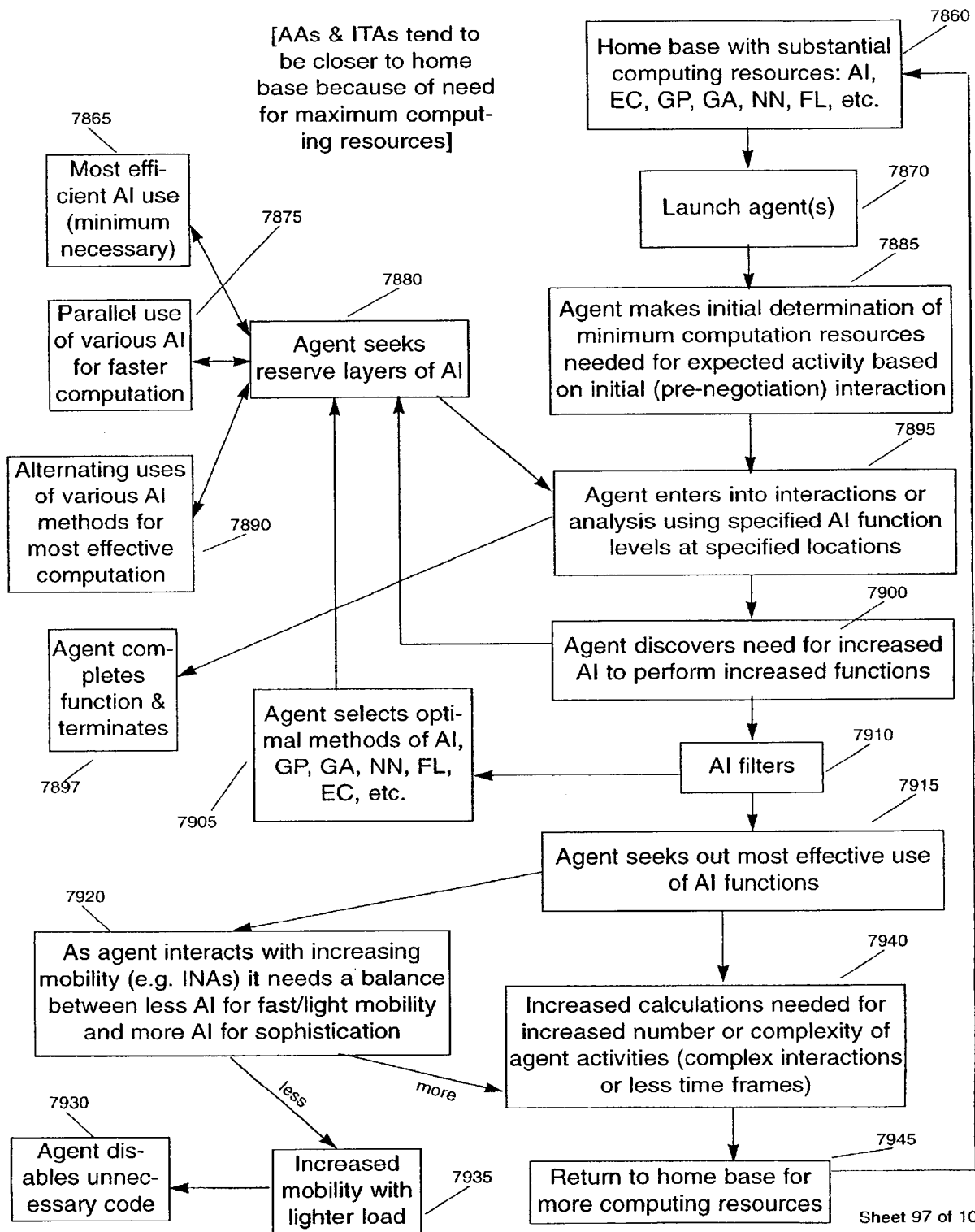


**Fig. 79: Evolutionary Computation Architecture and AA/INA Applications**

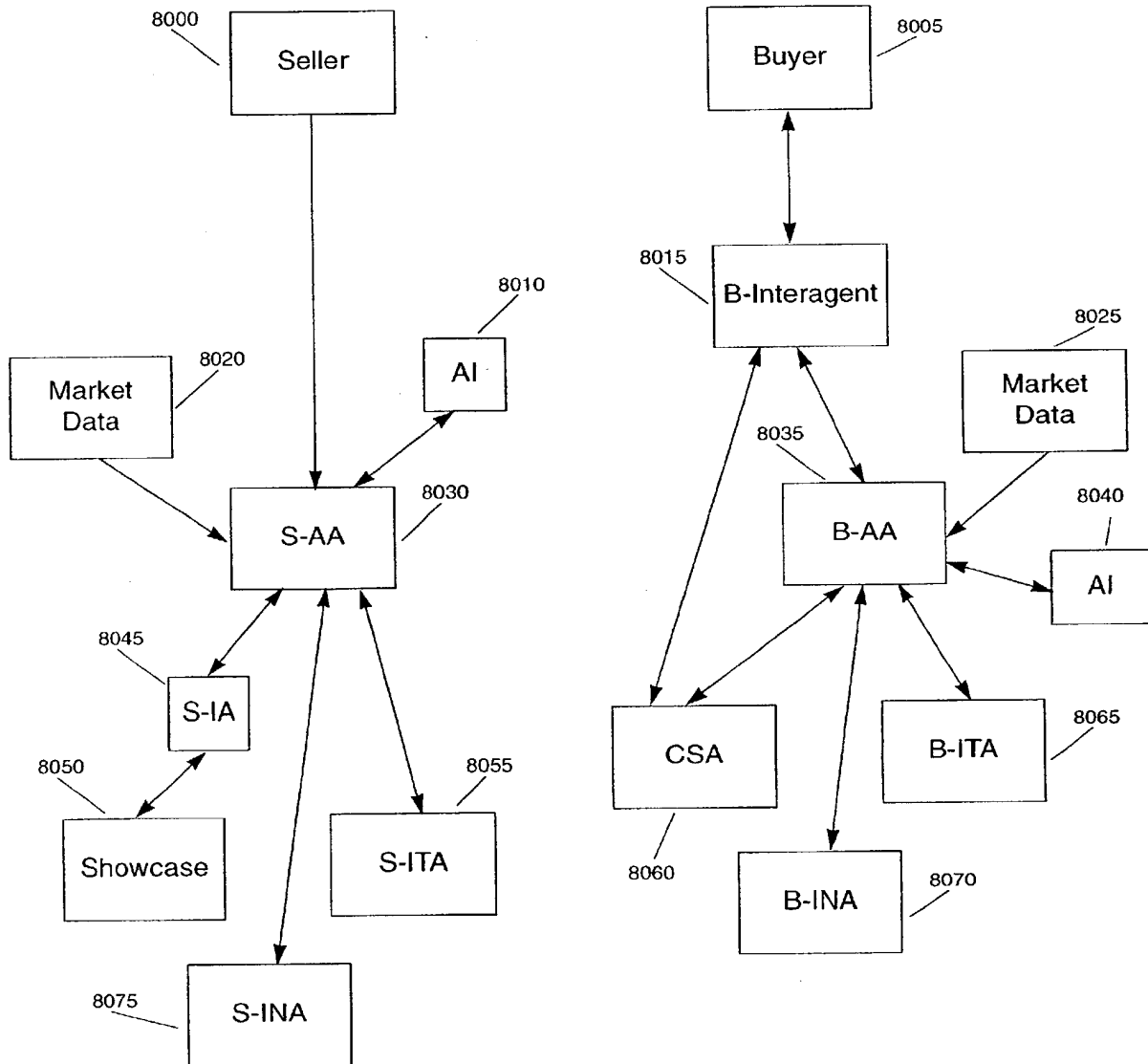




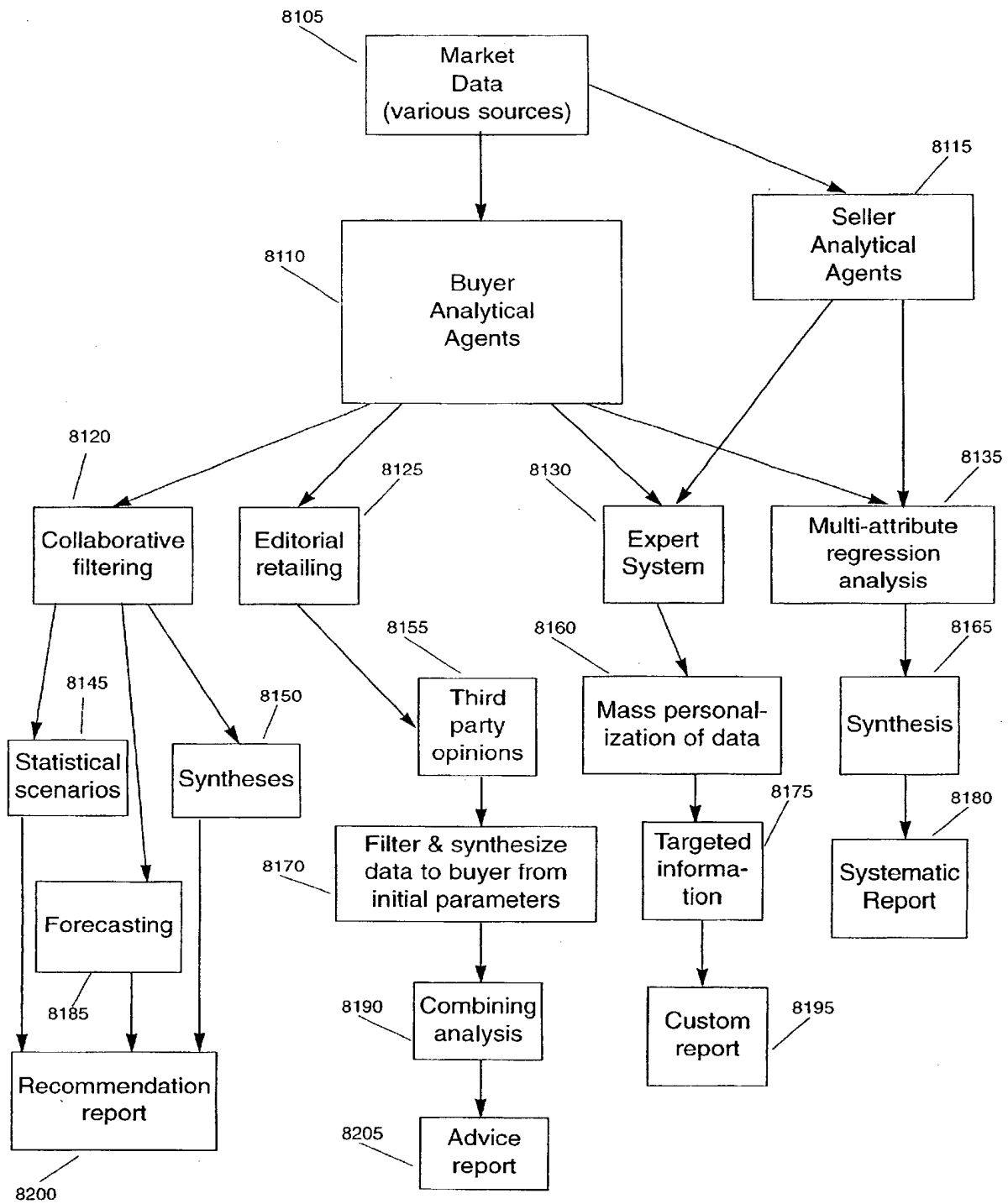
**Fig. 80: Layered AI For Optimum Agent Mobility**



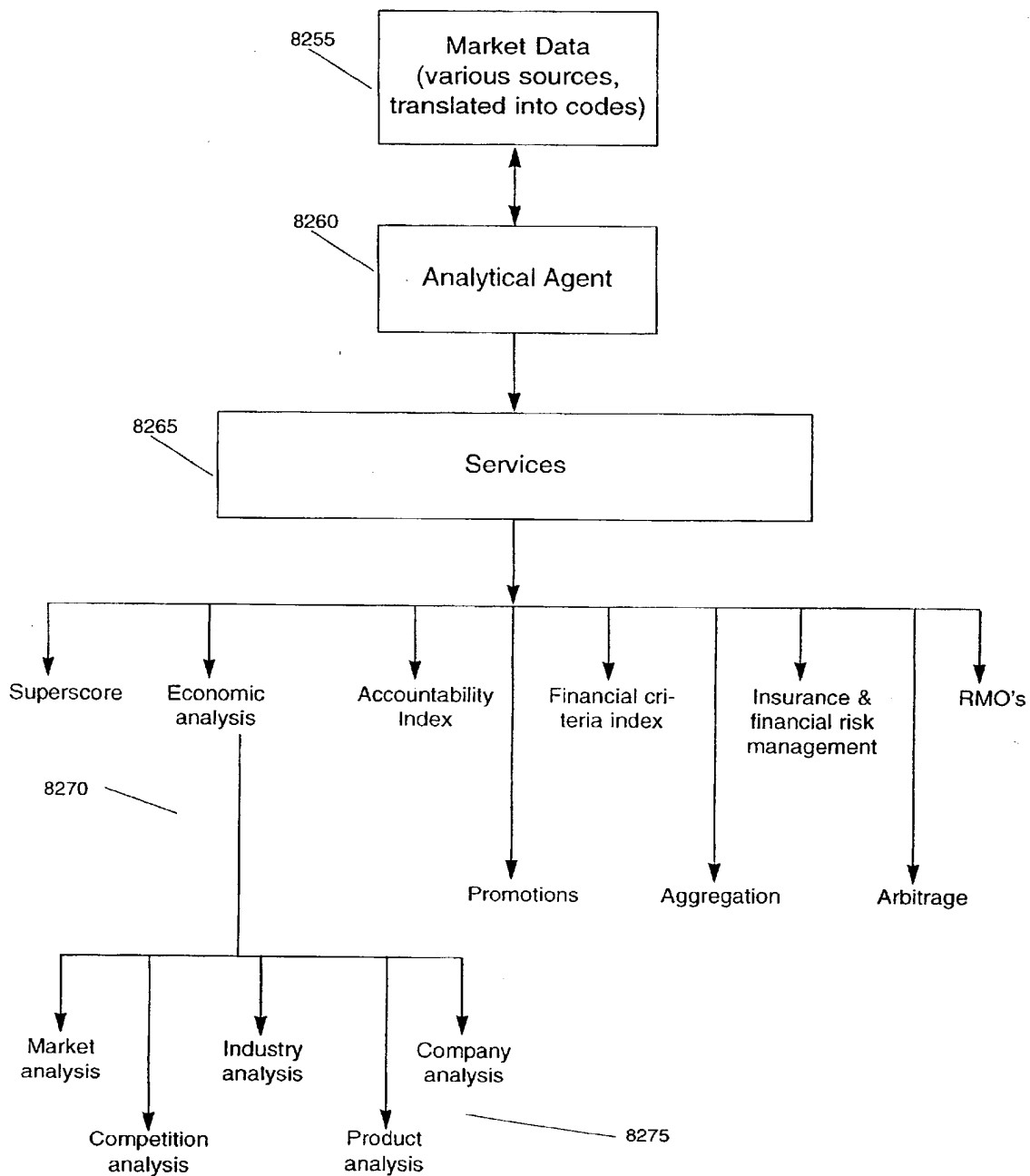
**Fig. 81: Analytical Agent System Architecture**  
Buyer vs. seller viewpoints



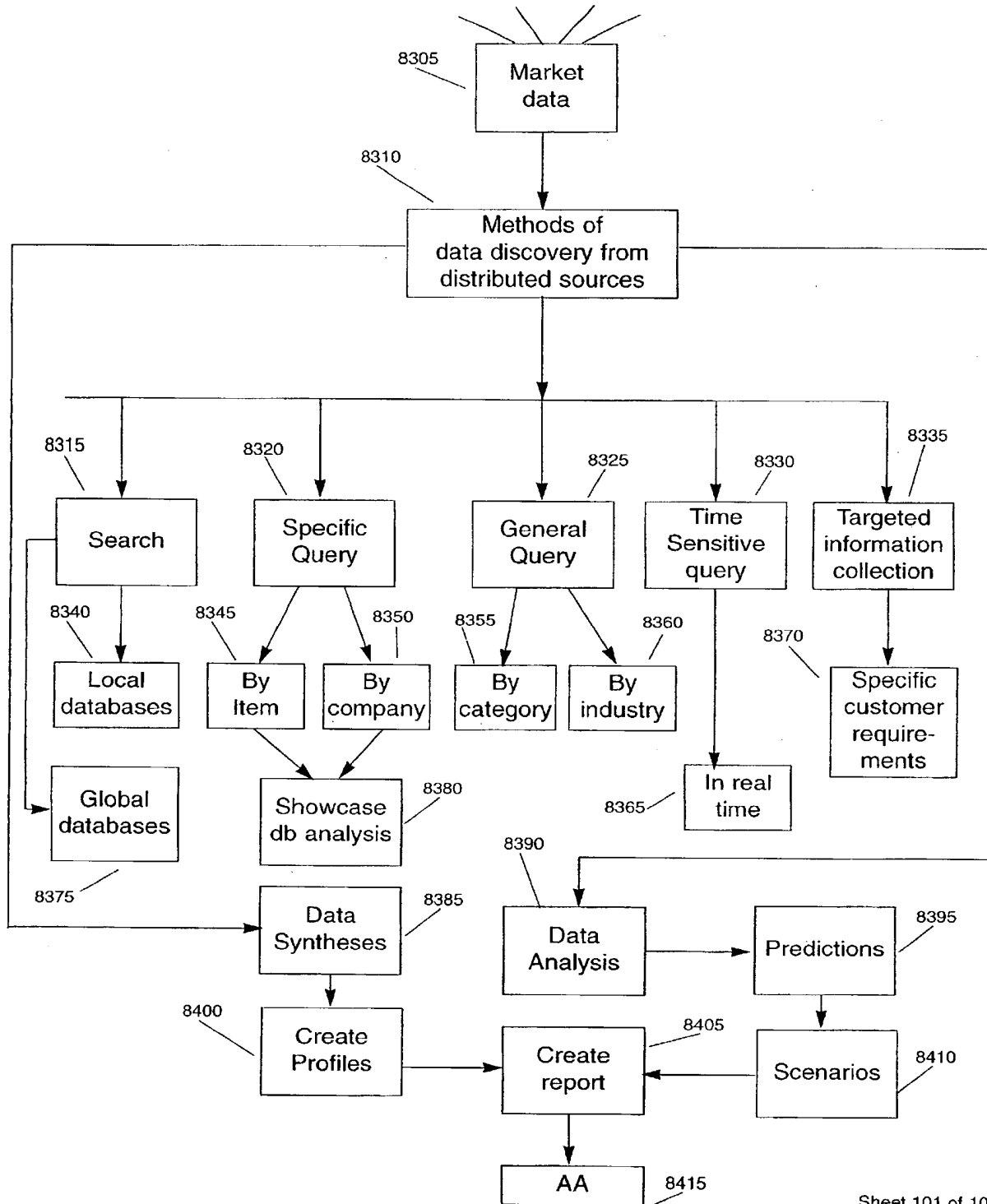
**Fig. 82: Kinds Of Data Analysis & Syntheses**



**Fig. 83: Analytical Agent Data Flow Process**



**Fig. 84: Data Mining Approaches**  
CSA & AA interactions



**Fig. 85: Advanced Collaborative Filtering for Cross Marketing Recommendations**

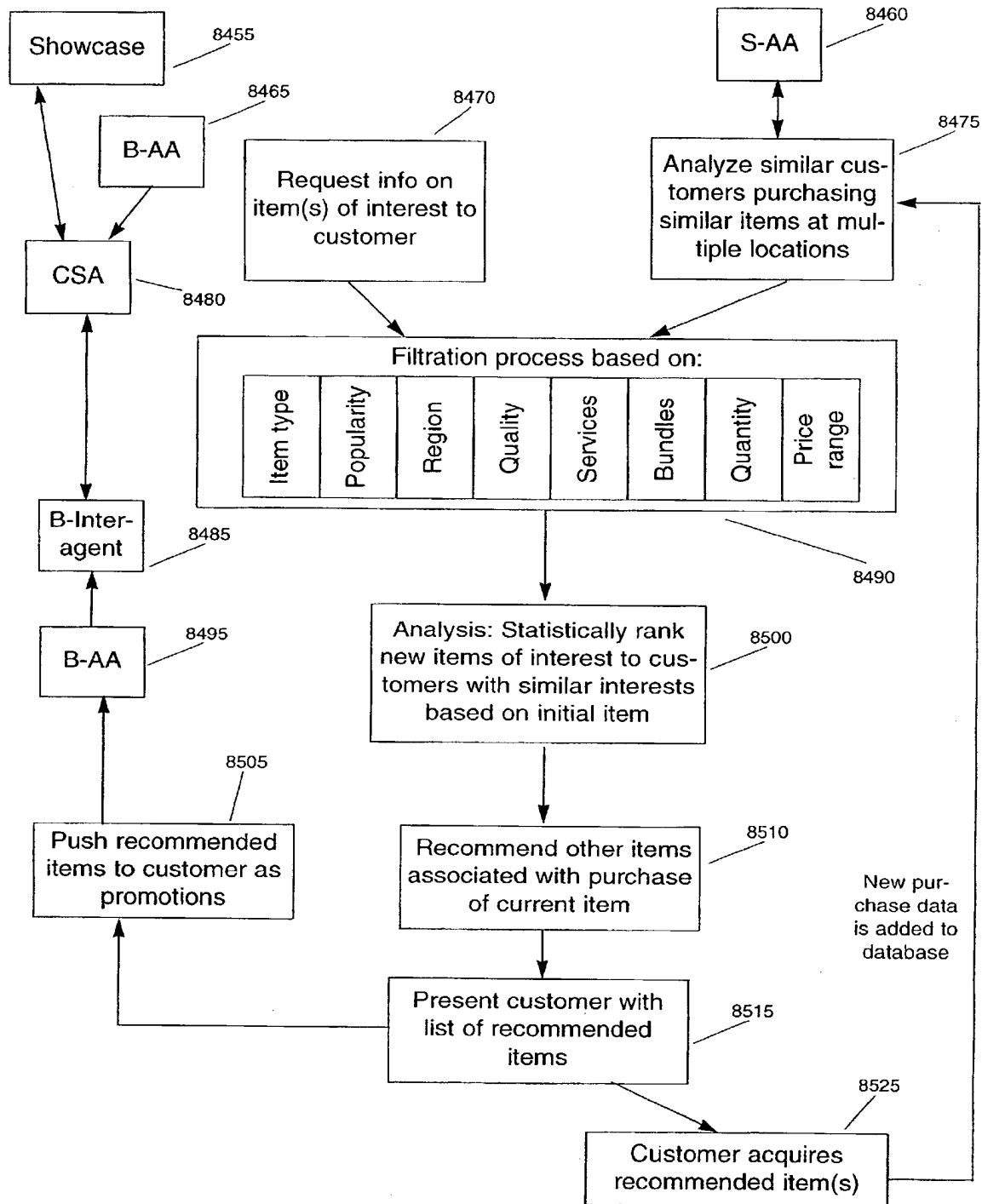
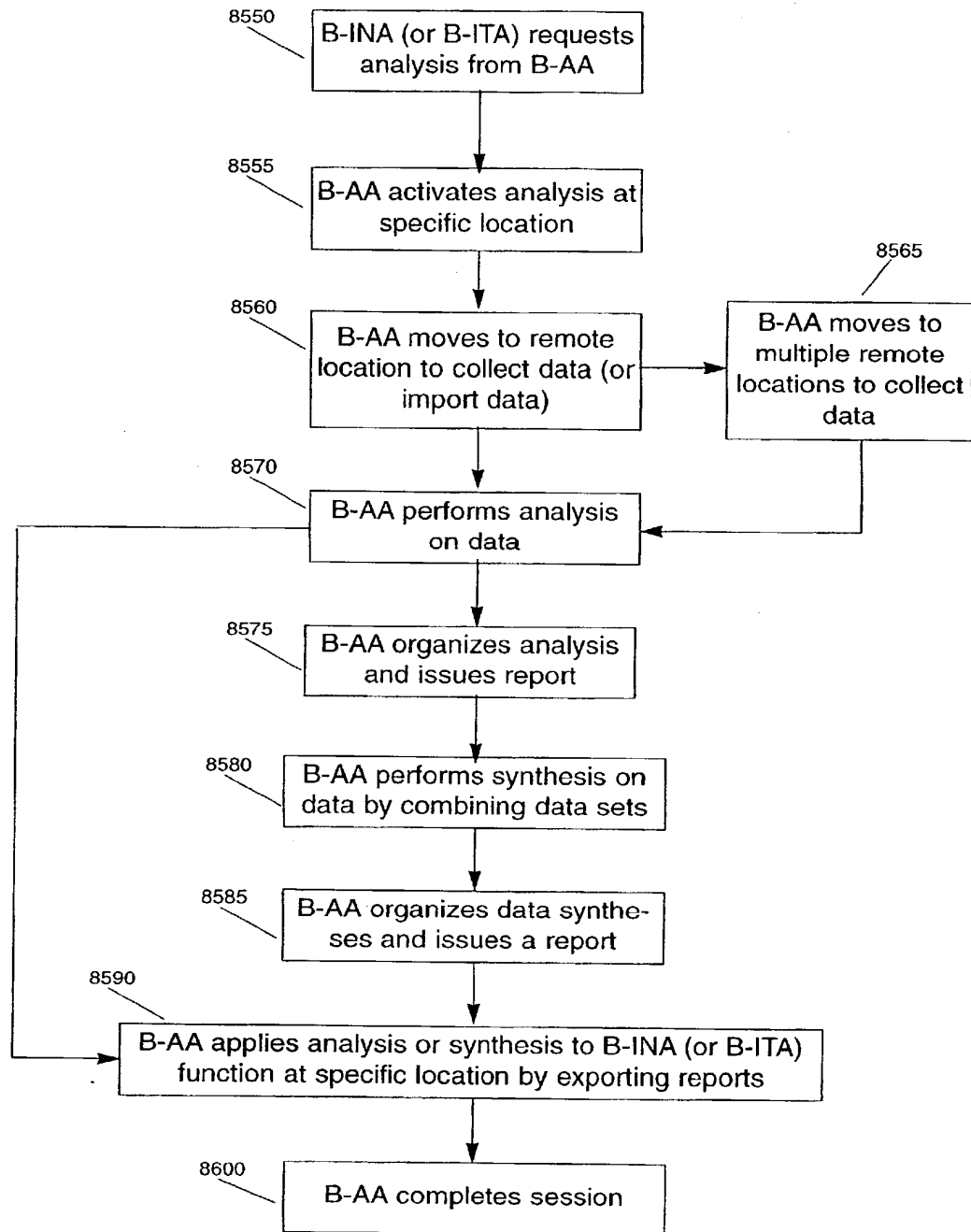


Fig. 86: B-AA Operations With Mobility



**Fig. 87: Super-Score System: Negotiated Variables**

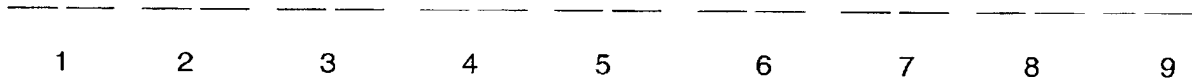
1. Object Description – need reference to adaptable tables
2. Seller Description
3. Buyer Information
4. Buyer Credit Data
5. Finance opportunities – credit
6. Seller Promotions
7. Risk Management Options
8. Market Data on Multiple Sellers & Buyers

1	2	3	4	5	6	7	8
9. Industry Code	10. Unit Quantity	11. Unit Quality	12. Time to deliver	13. Bundling code — discounts	14. After Sales rating code	15. Quantity Code – each # signifies group category 1-100, 100-1000 etc.	16. Location of Negotiations
9	10	11	12	13	14	15	16



**Fig. 88: Economic/Market Analysis Variables**

1. Industry Code
2. Industry Analysis
3. Product Analysis
4. Need Index of average prices for each main sector – trends, changes
5. Prices relative to market averages
6. Intra-company analysis of products/services – scope, growth rate change, etc. analysis of data
7. Probability scenarios of industry company
8. Broad Market Analysis (as service)
9. Economic indicators



10010067-120301

**Fig. 89: Accountability Index System Variables**

1. Bidding History
  - a. % bid
  - b. # of bids
  - c. % of bids won
  - d. # of bids won
2. Follow Up History
  - a. # & re-negs
  - b. # & returns
3. Credit History
  - a. credit limit
  - b. credit growth
4. Risk Factors
  - a. fast changes outside
5. Flexibility ratio
  - a. customer/seller as less rigid to accept deal
6. Tracking Pattern of Negotiation
  - a. figuring into accountability index
7. Transaction Prior Experiences
  - a. bidding history
  - b. success
  - c. problems
8. Follow through ratio
9. Accountability Index
10. Specify factors
11. Credit factors
  - a. debt ratio to net worth
  - b. paying on time
  - c. use up to limits, floating debt
  - d. credit limits
  - e. # of accounts
  - f. risk of default
12. Identify/authenticate agent/entity
13. Responsiveness to requests
  - a. In time factor

1	2	3	4	5	6	7	8
9	10	11	12	13			

## Fig. 90: Financial Criteria Index System

30+ Digit Code

1. Net Worth
2. Income
3. Cash Flow
4. Level of Debt to net worth
5. Public records
6. Value of assets
7. How much credit limit is used
8. How often up to (or over) limit
9. Financial Criteria factors
10. Length of credit accounts
11. Credit Limit
12. Unsecured vs. Secured debt
13. Derogatory Credit – over limit past due
14. Number of moves
15. Frequency of Place
16. Final Index Number to put in Super Score

10010057-120301

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

**Fig. 91: Insurance Risk Factors**

1. Use of Stats to establish rates
2. Kinds of losses specified
3. Claim-Adjustment Procedures
4. Claims Procedures
5. Errors
6. Omissions
7. Fraud
8. Accident
9. Premium Accounts
10. Limits/amounts of insurance
11. Full vs. Partial losses
12. Entity past record of claims
13. Costs of losses
14. Risks of specific events
15. Risk of limited loss
16. Risk of total loss

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

**Fig. 92: List Of Services**

1. ITA (Transactions)
  - a. Actual banking services
  - b. Aggregation (for better deals)
  - c. Insurance
  - d. Warranties
  - e. Payment Processing
  - f. Tax Collection & Payments
  - g. Escrow
  - h. Due Diligence
  - i. Legal, tax, customs
  - j. Compliance
  - k. Accounting
  - l. Shipping/delivery
  - m. Delivery tracking
  - n. Post-sale reporting
2. AA (Analysis)
  - a. Economic analysis
  - b. Market/industry analysis
  - c. Company, product & service analysis
  - d. Financial & credit analysis
  - e. Accountability Indices
  - f. Superscore
3. Risk Management Options
  - a. Penalties for sellers not fulfilling by specified time
  - b. Risk priorities – order of preferred risks
  - c. Arbitrage penalties
  - d. Option swaps (exchanging opposing kinds of risks)
  - e. Dynamic pricing of risks based on peak/low risks environment
  - f. MTO Penalties
  - g. JIT Penalties
  - h. Risk Sharing
4. Promotions (CSA)
  - a. Discounts
  - b. Aggregation (group discounts)
  - c. Promotional guarantees
  - d. Promise to provide item by specific time
  - e. Quality increase offer
  - f. Bundling products & services
5. Insurance Risk Management
  - a. Liability (product/service, business, individual)
  - b. Dynamic pricing based on peak risks
  - c. E&O Fraud risks
  - d. Risk of event loss
  - e. Re-insurance – Insurance risk sharing
  - f. Accident risks
  - g. Degrees of losses
6. Financial Risk Management
  - a. Credit analysis /buyer, seller
  - b. Secured debt – kinds of assets
  - c. Unsecured debt
  - d. Structured fin.-by asset category (securitization of assets/debt)
  - e. Packaging debt
  - f. Packaging Ins. & Fin. Opportunities
7. Additional Services
  - a. Bundling products &/or services
  - b. Customized orders
  - c. Mass-customization
  - d. Just-in-time items
  - e. Aggregation of bundles
  - f. Arbitrage of items & bundles
  - g. Computation resources
  - h. Bandwidth resources